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A HIGHWAY TRACTION ENGINE.

The attention of inventors not only in Wisconsin but of the whole country has been called to the subject of road engines by the liberal offer of the Wisconsin State Legislature of \$10,000 prize money to be given to any person who should invent and build a road engine which should possess certain qualities. It should be cheap in cost and be able to haul a considerable amount of freight at a reasonable rate of speed over ordinary highways. Two competitors made the trial trip last summer, but it was the opinion of the commissioners of award that neither possessed sufficient merit to be entitled to the award. Other trials will be made next summer, and no doubt many inventors are quietly at work endeavoring to solve the problem and gain the coveted prize, as well as the subsequent fortune that surely awaits the fortunate winner by the manufacture and sale of road engines so endorsed. The accompanying illustration represents an improved traction engine now in use in California. This engine has three traction wheels all propelled by beveled gearing.

The following are the principal dimensions: Boiler—length over all, 10 feet; boiler, diameter of shell, 48 inches; boiler, thickness of shell, $\frac{1}{2}$ inch; boiler, fire box sheets, $\frac{3}{8}$ inch; load on driving wheels, 2,300 pounds; steam cylinders, diameter, 8 inches; stroke of pistons, 12 inches; revolutions of crank to one of driving wheels, 10; driving wheels, diameter, 72 inches; driving wheels, breadth of tire, 12 inches.

The boiler is a new and peculiar multitubular arrangement, which makes steam as fast as required, from a comparatively small amount of water, doing away with considerable bulk and weight. There are two engines mounted on top of the boiler; the crank shafts are coupled and the cranks are set quartering to avoid the possibility of ever stopping on the center; the bed plates have the cross-head guides cast solid with the bed; and the cylinders are secured in sliding bearings fastened by flanges to boiler-brackets; by this means the expansion and contraction of the boiler is accommodated, avoiding a considerable strain on the engines. The driving gears or angle shafts, are on each side of the machine as shown, and are driven by the beveled pinions on each end of the engine shaft. The angle-shafts run in angle bracket boxes, so that one pair of shafts having beveled pinions run the forward wheel-gears, and the other pair of angle-shafts also have beveled pinions that drive beveled wheels secured to the rear traction wheels. The forward driving gears are keyed to the outer ends of the forward axle, or driving shaft, more properly speaking, as the latter drives the forward or steering wheel, but at the same time allowing it to be moved in an arc of a circle sideways at any angle desired for steering the machine. This is accomplished by means of a ball and socket joint in the hub of this wheel.

This ball and socket joint is the most ingenious part of the whole machine, and to accomplish the work of driving the wheel in all positions, a number of steel keys are fitted in the ball, and projecting to work in slots cut in the shell or casing of the ball.

This casing has projecting faces with revolving rings on each side of the wheel, and to these rings are bolted arms on each side running back to a gear segment, operated by a pinion on the end of an upright spindle or shaft with a hand-wheel at the top, just in front of the steersman's seat; here the man

piloting the machine has control of the throttle valve and reverse lever.

This is the first instance in which the steering wheel has been made to propel the machine; and it can be made to do the work independent of the hind wheels, in case of necessity; as for instance when both hind wheels become mired, or get into quicksand, or deep ruts in the road. This is accomplished by having self-adjustable clutches on the hind wheel shaft, also for backing, etc.

In all of the traction engines heretofore built, only two wheels have been employed to propel the machine, but in this invention all of the wheels on which it runs are traction wheels, and more than three may be employed if desired. This machine was used for a considerable length of time in the State of Nevada, hauling ore and other freight from mines to mills, etc., running up mountainous roads (where mule teams had been used); the grade being in some instances 530 feet to the mile, and hauling ten tons on wagons at a speed of

plow his ground, and at the proper time haul away his grain or other freight, running in any direction without reference to depots or tracks that at present are so necessary for the transportation business of the country.

From the recent trial of this engine, the constructing engineer deduced the following conclusions: A traction engine, or road locomotive, may be constructed upon this plan, so as to be easily and rapidly maneuvered, hauling a long line of freight wagons on the ordinary roads, and turning without difficulty on a circle such as are common at all cross-roads.

A locomotive weighing six tons is capable of hauling 25,000 pounds up a grade of 525 feet to the mile at a speed of $3\frac{1}{2}$ miles an hour. The traction power of the machine tested was equal to 30 horses.

The coefficient of traction was shown to be about 0.5; the weight that could be drawn on a perfectly smooth and level road was 175,000 pounds; this is exclusive of the weight of the

was considered at the time a good quality of flour, but to-day they are standing monuments of the progress of the age, modern improvements having rendered them wholly worthless for the purpose to which, until recently, they were devoted.

"Patent process machinery is expensive and so radically different from the other, that remodeling old mills but poorly meets the requirements of the system. Therefore, only a few millers in this State have as yet availed themselves of the latest improvements, and since the tendency of all large manufactories is toward concentration in cities, where supplies are easily obtained, and distribution more readily effected, country millers having no railroad competition will be slow to invest another fortune in a mill, since, in any event, they must probably at an early day, restrict operations to neighborhood and custom work.

"The present, therefore, is an opportune time for the construction of one or more patent process mills, at this point. A large portion of the 5,600,000 bushels of wheat brought here in 1878 should have been manufactured into flour before leaving the city. With such a supply of the best wheat the quality of flour and magnitude of the trade would give us first rank in the markets of the world.

"The early shutting down of these old mills curtailed production last year, but in no other respect have we fallen behind. The year was fairly profitable, notably so to manufacturers of patent process, the product of one firm alone since harvest reaching 72,000 barrels, which sold on its merits in Eastern cities at 25 to 75 cents per barrel higher than any winter wheat flour made west of the Alleghenies. Orders from Great Britain and Europe are regularly filled, and direct shipments to foreign parts cut no small figure in our trade.

"Our millers make a point of grinding none but the first quality

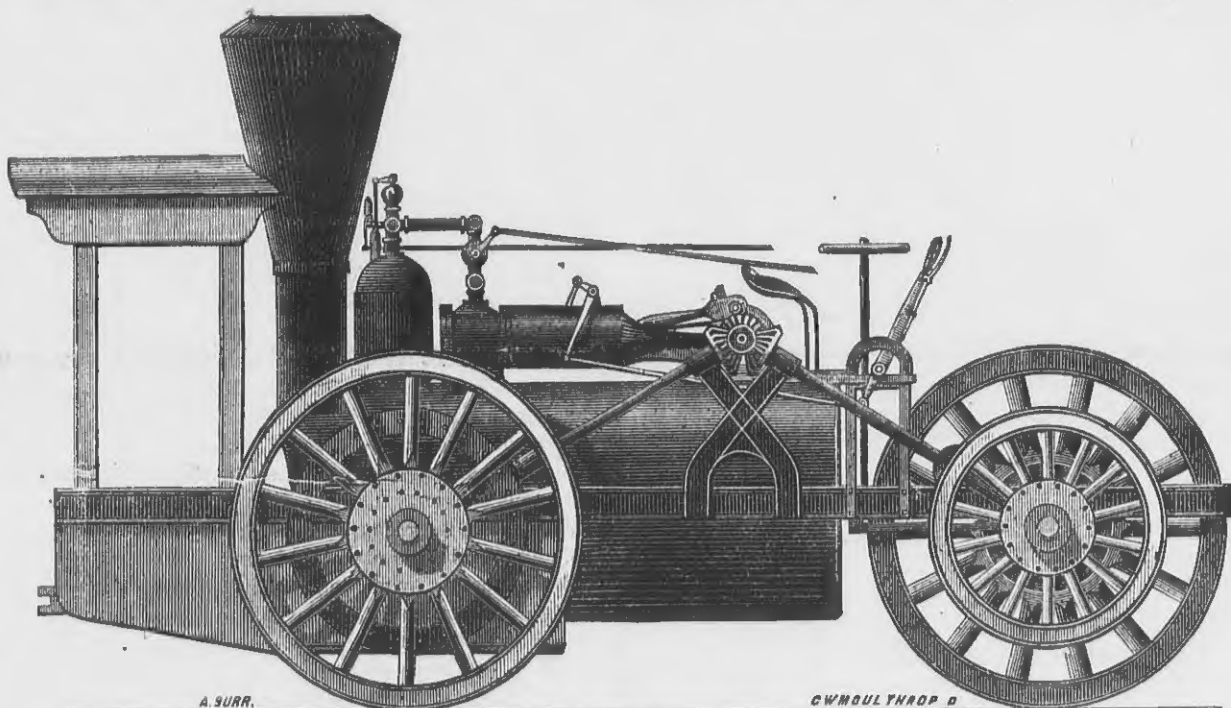
of wheat, and generally the hard winter varieties of this State, the flour from which brings the highest prices at the seaboard and in foreign markets.

"Table showing the receipts and shipments of flour at Indianapolis, and number of barrels manufactured in this city, for three years:

	1876	1877	1878
Received, bbls.....	1,113,332	907,950	1,051,300
Made here, bbls.....	146,522	203,513	192,000
Total.....	1,259,854	1,111,463	1,243,300
Shipped.....	1,197,110	1,201,160	1,176,200
Consumed here and unaccounted for.....	62,644	91,303	67,100

NOVEL EXPERIMENT.—Another instance of Transatlantic enterprise is the presence at Geneva of a locomotive brought expressly from America to test its capacity for producing steam from the anthracite coal found in the Valais, and which Swiss and French locomotives, as at present constructed, are quite unable to use. The furnace arrangements of the American locomotive are admirable. It can run with fuel which would bring the ordinary Continental locomotive to a standstill; and the system, if adopted in this country, as it doubtless will be, cannot fail to effect an important saving in the working of railways.

A NEW ROTARY ENGINE.—Mr. Babbitt, the well-known soap manufacturer, of New York, has invented a rotary steam engine, which is said to develop extraordinary power, with a very small steam supply. A correspondent of the *American Machinist* reports having seen one, four inches in diameter, running 20,000 revolutions a minute, with steam supplied by an one-eighth inch pipe, which defied the efforts of the heaviest men to stop it by throwing their weight upon a good lever.



CALIFORNIA ROAD ENGINE.

two and one-half miles per hour. After working for one company until their mines gave out, the machine was brought to Sacramento, where it was employed in house moving and other heavy work.

The Sacramento Wood Co. have recently bought a Pacific coast interest in this invention, and have put the machine to a very severe test, showing its ability to haul heavy freight in a successful manner. Captain J. Roberts, the leading spirit of the company, took this machine up the Sacramento River on one of their steamers, and landing in Colusa county, where they run regular trips back into the country, a distance of 16 miles, taking freight from the steamer, and bringing wheat back, they loaded six Bain header wagons with 800 sacks of grain, also hauling one extra Bain header wagon containing a tank in which they took 615 gallons of water, besides $1\frac{1}{2}$ tons of coal, making over 24 tons total freight in wagons; the machine also carried tanks secured at each side of the boiler, these holding 250 gallons of water. Five miles of the road was very dusty, and full of ruts, and several sloughs to cross, making a very severe test of the traction power of the machine. But if the roads are level, hard and free from ruts, the machine is capable of hauling 35 tons at a speed of three miles per hour.

The machine works admirably as to pulling or traction qualities. The machine weighed on the scales—having steam up and 250 gallons of water in the tanks, also coal in the cab—11 $\frac{1}{2}$ tons total weight.

This traction engine will run over any kind of ground; it can enter any farmer's field,

engine, and the amount of fuel required is estimated at 1,600 pounds a day. In handling the machine the most experienced and skillful men are required. The difference between the performances of the same engine in different hands was 12 per cent.

It is estimated that the expense in heavy hauling by steam is 25 per cent less than the cost of horse-power on an ordinary road. A much larger and more powerful machine is now being built for the company by Root, Neilson & Co., Sacramento. The inventor is Mr. R. R. Doan, who commenced many years ago to study the problem of substituting steam power for animal power on the highways and for farm use.

We are under obligations to Messrs. Root, Neilson & Co., of San Francisco, Cal., for the accompanying illustration.

INDIANAPOLIS FLOUR INDUSTRY.

From the report of the Secretary of the Indianapolis Board of Trade, just made, we make the following extract:

"The process of manufacturing flour has undergone great changes within the past few years, and the successful miller finds it necessary every year or so to expend large sums of money to meet the competition created by the number and variety of improvements introduced into modern milling, the adoption of which is necessary to the manufacture of a grade of flour to command a remunerative price and ready sale in the markets of the world.

"Our old city mills, remodels of the 'mill by the willow brook,' manufactured what

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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READ the new advertisement of Smith Bros.

CHISHOLM's last describes a building as "50 by 60 feet square."

JONATHAN MILLS has now invented a bran-cleaning machine, and still he is not happy.

W. R. BACON, a prominent miller of Sherwood, Wis., called on us during the month.

J. SHORT, Esq., of Oswego, N. Y., called a few days since. He came to see the new flouring mill.

M'LEAN'S Millers' Text Book and the UNITED STATES MILLER, for one year, for \$1.25. Order now. Send money or postage stamps.

It is said that one-tenth of all the sheep in the State of North Carolina were killed by dogs in 1878. *Dry-m* such a state of affairs.

POSTAGE stamps taken in payment of subscription to the UNITED STATES MILLER and the Millers' Text Book. \$1.25 pays for both for one year.

A. M. HUBBS, Esq., of Waupaca, Wis., agent for Barnard & Lens' Manufacturing Company, of Moline, Ill., called and reports prospects good.

WE regret to announce the death of Belle Clifton, wife of Albert Hopkin, editor of the *Northwestern Miller*, which occurred January 11th, 1879, at Lacrosse, Wis.

WE call the attention of our readers to the interesting essay on *grain for milling* read by the author before the Pennsylvania Millers' Association January 15th.

COL. GRATIOT has dropped in on us several times during the past month, and is almost half persuaded to move to the Cream City. We shall do our best to get him to locate here.

A MILLION franc telescope is to be built in France for the purpose of discovering whether the moon is really inhabited. If it is then we must have a moon-o-phone to talk with the man in it.

A STOCKTON, Cal., engineer screwed down the safety valve on his engine and swore he would make the thing "work or bust." It busted and the engineer and a score of victims went up "the golden stairs."

IN our March number we shall commence the publication of an article on steam boilers which will be embellished with 14 illustrations. It will be interesting to all users of steam. Subscribe now, \$1 pays to May, 1880.

ST. LOUIS has 27 flour mills having a united daily capacity of 11,750 barrels of flour. The flour product of St. Louis for 1878 was 1,916,290 barrels; for 1877, 1,617,921 barrels, and

for 1876, 1,441,944 barrels. During 1878 St. Louis mills also manufactured 348,695 barrels of corn meal; 20,121 barrels of rye flour, and 19,853 barrels of hominy and grits. This record shows St. Louis to be the largest flour-producing city on this continent.

W. LEE, of Racine, Wis., who advertised for a situation last month, in the UNITED STATES MILLER, has secured thereby a desirable one at Sherwood, Wis., in W. R. Bacon's flour mill.

We will send a copy of the MILLERS' TEXT BOOK, by J. M'LEAN, of Glasgow, Scotland, and the UNITED STATES MILLER, for one year, to any address in the United States or Canada, for \$1.25. Price of Text Book alone, 60 cents. Send cash or stamps.

IN this number we continue our article on grain and its products. In March number the author will take up the subject of wheat-flour and discuss it thoroughly. Every miller should study it carefully. Subscribe now, \$1 pays to May, 1880.

WE are pained to announce the death of Mr. John Temple, of the widely-known firm of Stout, Mills & Temple, of Dayton, Ohio. Mr. Temple was a highly-respected citizen, loved and honored by all who knew him best, and leaves behind him countless friends to mourn his loss.

LOOK HERE.—Every mill-owner, miller, millwright and apprentice should have a copy of the Millers' Text Book, by J. M'Lean, of Glasgow, Scotland. Price 60 cents; or the UNITED STATES MILLER, for one year, and a copy of the Text Book for \$1.25. Postage stamps taken.

IN Siberia you can buy beef for two cents a pound, a goose for twelve cents, a chicken for four cents, a horse for \$5, and three hundred and sixty-one pounds of corn for six cents.—*Ec*

Goose for twelve cents! Very cheap, but then its Siberian goose, and there are many objections to the climate, customs, and jaw-breaking language of the country.

THANKS are hereby extended to Geo. H. Morgan, Esq., Secretary of the St. Louis Merchants Exchange, for a copy of the St. Louis trade and commerce for 1878. The report shows an excellent trade notwithstanding the unusual depressing effects of the yellow fever scourge in the South and the subsequent low water in the river.

THE invention of Wm. Lehmann for truing the grinding surfaces of mill-stones has caused considerable excitement among our millers. It is so simple and yet so perfect that lots of them wonder that they never thought of it before. It is generally used in our Milwaukee mills and we predict will spread. Good things are "catchin'" amongst millers.

Advertisers will consult their own interests by patronizing the UNITED STATES MILLER, which circulates almost exclusively amongst the flour milling class. It has the largest circulation of any milling paper published in America, and was the first independent milling journal started in the United States not being connected in interest with any patented machine or milling supply house.

QUITE a number of mill-owners from different parts of the country have visited Milwaukee to see for themselves the Milwaukee Milling Company's new mill described in this journal last month, and are astonished at the wonderful success of the little patent mills. The Milwaukee Middlings Mill-Stone Company are receiving orders from all points of the compass.

O. L. PACKARD, of 87 West Water street, Milwaukee, reports quite an improvement in business and the receipt of numerous orders for supplies, for several engines, also for a saw mill, a 2-run mill, a portable mill and iron and wood working machinery. He has recently shipped an outfit to Missouri and a large planer and matcher to Arkansas. Included in the last order was some mess beef.

THE TOLL BILL.—A member of the Wisconsin Assembly, from the "rural deestreeks," desiring to make himself popular with his neighborhood-grangers, has introduced the usual bill to change the present rate of toll from one-eighth to one-tenth. There seems to be no objection to the present rate, it being generally satisfactory to both farmers and millers. A few winters ago a similar bill was

introduced, and a member voting against it said: "I am opposed to increasing the rate of toll from one-eighth to one-tenth. I think the millers get enough now, and therefore vote No." And his example was followed by a majority of the House. The bill will undoubtedly be killed.

M'LEAN'S MILLERS' TEXT BOOK is no advertising clap-trap. It contains no advertisements at all. It is a book of instruction, written in simple, plain language, that anybody who can read English can understand. The apprentice with this for a pocket companion can learn more in a month than without it in a year. Price 60 cents, or the UNITED STATES MILLER, for one year, and a copy of the Text Book for \$1.25. Cash or postage stamps taken. Address UNITED STATES MILLER, Milwaukee, Wis.

THE FINEST MILL IN SOUTHERN MINNESOTA OWNED BY MILWAUKEEANS.—The fine new steam mill at Peterson, Minn., has passed into the ownership of Filer, Stowell & Co., and is soon to be remodeled after the style of the Milwaukee Milling Company's new mill, in Milwaukee, unless they sell it soon. It has eight run of four-foot buhrs, and is in all respects a modern mill, having cost some \$33,000. All the machinery of the mill, except a part of the cleaning machinery, having been built by this Milwaukee firm, is an assurance that the mill is thoroughly well built.

MR. ANGELL has of late been making some pretty tough statements about the great amount of adulteration of food, for which a great number of papers take him to task and soundly abuse him. While Mr. Angell may have drawn the picture a little too strong, we think the attention of the public has been called to the subject through his statements, and that nothing but good results will follow the investigations sure to be made. Adulteration, cheating, and selling goods under false brands are too frequent. The *New England Grocer*, which criticizes Mr. Angell strongly itself, says: "There is much complaint among grocers that the brand on a barrel of flour has ceased to be a true indication of its contents and of the maker." This state of affairs demands a remedy, and it must be provided soon. We frequently see flour branded HAXALL (the celebrated Virginia brand) being carted through this city which was made here in Wisconsin. Of course, there are some rogues amongst millers, and the using of false brands is one of their tricks. Law should be made for such cases, and our legislators would serve their constituents better by making it than wasting their time and the people's money in buncombe speeches and toll-regulating bills.

THE COCHRANE CASE.

This case which has been so long before the milling public came to trial at last in St. Louis before the United States Circuit Court; Feb. 10th. Three Judges, Nelson, Dillon and Treat, sat on the cases; the St. Louis cases to be decided by Judges Dillon and Treat, and the Minnesota cases by Judges Dillon and Nelson. Both sides have been preparing for this contest for a great length of time, and the testimony taken filled two large printed books. The Court room was filled with drawings and models of mills and milling machinery and samples of flour, middlings, etc., supposed to bear on the case. The prosecution was represented by Rodney Mason, of Washington, D. C.; Chas. F. Blake, of New York; W. K. Gibson, of Jackson, Mich., and Chester H. Krum, of St. Louis. The defense was represented by Geo. Harding, of Philadelphia; Gordon E. Cole, of Minnesota, and Frederick N. Judson, of St. Louis. The Court room was constantly filled by parties interested in the case. We had prepared a full and complete report of the case for publication, which would fill many pages of this journal which would make interesting reading if the case was not concluded, but the trial was concluded Feb. 26th, and the matter submitted to the Judges who will not give their decision until the next term of Court. Under these circumstances the reading of the report of the trial would be a good deal like eating "dead crow," and we feel satisfied that not one miller in 500 would wade through it. Suffice it to say, all was said and done on each side that money or brains could do or suggest, and the matter is now in the hands of the Judges from whose decision we think there will be no appeal taken, be it as it may.

At about the close of the trial Mr. Rodney Mason, of counsel for the plaintiffs, moved to dismiss the case against Messrs. E. O. Standard & Co., one of the St. Louis parties against whom

one of the suits was brought. Subsequently J. B. M. Kohler & Co., also of St. Louis, effected a settlement on the basis of \$100 per run of stone. These announcements fell like a thunder-clap on other millers, and the gentlemen who saw fit to settle were roundly scored by their irate brethren, and the Missouri Millers' Association hastily called a meeting of what members could be quickly brought together, and expelled the gentlemen above-mentioned from the Missouri Association.

To us it looks like poor policy for these gentlemen, who have persistently fought the case so far, to settle at such a time, even if in their judgment the case was doubtful, as in all probability the measure of damages would be put at a low figure if the patentees should succeed in winning, which the counsel for the millers claim there is no danger of.

Be it as it may, there is now the satisfaction that the trial of the most important milling case ever before the Courts is concluded, and we look for the decision in the early part of May. If it is in favor of the millers there will be a big jubilee at the next meeting of the Millers' National Association; if against—why—well, we suppose the other fellows will have the jubilee.

THE GRATIOT WHEAT HEATER.

Judging by the subjoined letter we should say that the Gratiot Wheat Heater fully and perfectly meets all the requirements:

WASHBURN B MILL, MINNEAPOLIS, Minn., Jan. 30th, 1879.—Messrs. Gratiot Bros., Platteville, Wis.—GENTLEMEN: I have been absent or should sooner have answered your favor of the 11th of January. In regard to your Wheat Heaters I am able to say that I use no other. The first set up in this city were put in this mill some three or four years since, and yours were the only heaters in the Washburn Mill A at the time it was destroyed in May last. The new mill erected by me since the great fire has nine of your heaters, and I believe that it is the judgment of nearly all the millers here that your heater is the best one in existence, and I think it is now in use by most of the mills here, several of which have discarded other heaters to give place to yours. My experience is that your heater does its work perfectly and cannot be improved upon.

Truly yours, C. C. WASHBURN.

BRITISH BUSINESS CRISIS.

The present business revulsion in Great Britain recalls former periods of financial and commercial disturbance, during the present century, besides corroborating the soundness of the assumption that an undue expansion of credit and over-trading are sure to be followed sooner or later by commercial panics and periods of business demoralization and depression. The British panic of 1816 was caused by the enormous expansion of the various forms of credit which followed the restoration of peace after protracted wars. Hardly had the effect of the panic of 1816 disappeared before another swept over the country. This was ten years later, in 1826, and was brought about by substantially the same causes, aggravated, however, by an inflation of the currency. At the next session Parliament made provisions for the certain contraction of the currency, and by adhering to this policy a healthy condition was restored to business and industry, aided by several years of abundant harvests. The next financial crisis occurred in 1839. New banks had been organized and the currency largely inflated, credits extended, joint stock mining and all sorts of speculative companies had sprang into existence, and over-trading was the rule. In this as in all other instances, the panic was followed by bankruptcy, shrinkage of values, fall in prices, and prostration of business. A period of recuperation followed, after which, in 1857, came another revulsion, and in 1866 there was also a semi-panic. But probably none of them were more serious than the present disturbance. They were all the results of a violation of the immutable laws of economy, for which our country has for several years been paying the penalty.

ADULTERATED FLOUR IN LONDON.—Some flour was recently discovered for sale in London (an imported article by the way) which upon examination was found to contain over 70 per cent of plaster of Paris. Dr. Saunders the Medical Health Officer made due report thereof to the Lord Mayor, but from some technicality the case was dismissed. The doctor took some of it and moulded a pretty good donkey's head therefrom by way of experiment. A baker mixed some good flour with it and made bread therefrom, but on being informed that he would probably get into trouble if he sold it fed it to his pig. Dr. Saunders said "it was rough on the pigs."

BOTTLED BEER.

Messrs. Voelching, Shape & Co.'s Mammoth
Beer Bottling Establishment,
Milwaukee, Wis.

It has been but a few years since the trade in bottled beer assumed any very great importance, beer generally being sold by the keg, but after practical experiment it was found that in all cases where not consumed in large quantities and immediately upon being tapped as in some of the fortunate metropolitan saloons, that beer properly bottled was better and more convenient than in the old-fashioned way. Families—instead of ordering a keg of beer for use, which with the best of care will soon get stale, flat and unpalatable—now order by the case (two dozen bottles), and, when beer is desired, pull a cork and have the article in suitable quantity, always fresh, and perfect in condition.

Realizing the important trade that might be built up in this branch, Messrs. Voelching & Shape selected Jos. Schlitz's celebrated Milwaukee lager beer, which they believed to be the best for the purpose, and Jan. 1st, 1877, erected an establishment and commenced business. In September of the same year the firm was increased by the addition of Mr. Charles Uihlein as partner, and since then has been known as Voelching, Shape & Co. The sales for 1877 amounted to about a million bottles, and in 1878 the sales were much more than doubled, showing a very happy increase in business. The premises then occupied (46 by 150), on the corner of Third and Galena streets, being too small to accommodate their rapidly increasing business, they moved their building one block east to the corner of Second and Galena streets, and built a basement under it full size (46 by 150 feet), and 14 feet in height, and a large addition for the boiler, engine, and steaming tubs, and a new office. Passing through the office (warmed by steam), we come to the bottling house proper, and see filling apparatus and corking machines—two of each. Beer constantly runs from full barrels (31 gallons), hoisted on platform and remaining suspended until empty, into a trough with five sieves in it, through which it is strained, and thence passes into a lower trough, from whence it runs through twelve syphons into the bottles. One man is engaged at each filling apparatus putting on and taking off bottles. Full bottles are placed on the table of the corking machine, and are corked instantaneously. A full barrel is bottled and corked in the remarkable short time of 4½ minutes.

On one side of the building we see a tub for washing new bottles only; four girls attend to it. We next find floor covered with boxes full of freshly filled and corked bottles. A large number of boys are busy putting on wire; others with nippers are twisting wire and nipping off the ends.

We at once pass into first side room, where three large steaming tubs stand, and see boys carrying the same beer we saw on the floor, in boxes, into the steaming tubs, piling box upon box. Water is then turned on, then steam, until water and beer is heated to near boiling point. The water is then let off, and when the beer is sufficiently cooled off it is taken out and placed upon long tables in the center of the bottling house, where each bottle is tin-folled and labeled by girls. Going towards the rear we see a number of men busy winding straw around bottles, and packing them in barrels, for the Southern trade principally.

On the other side of the building beer is placed in boxes for shipping. In winter the bottles are packed in saw-dust to prevent freezing. In this way the firm ship their beer throughout the whole winter.

Passing down stairs, we find the boiler and engine room in an addition adjoining the main building. Entering the basement, we find boxes and bottles returned from customers, new bottles in great piles, three great tubs for washing old bottles, a cork washing machine (invented by one of the firm), also bottle washing machines and a machine for branding corks (the invention of Mr. Voelching). Here also is a carpenter-shop, where old boxes are repaired. The vault underneath the sidewalk adjoining the basement is filled with bottles which might be measured by the cord.

Stepping on the elevator, we ascended to the upper floor, which is used as a store-room for new boxes, band iron, corks, and other necessary supplies. The establishment employs over 50 men, many girls, and several teams. Agencies have been established all over the United States, Canada, Cuba, Brazil, and Mexico. The bottled beer is shipped from here in car-load lots to the various agencies,

and orders are filled direct to parties not living convenient to agencies.

The capacity of the establishment is now 100,000 bottles per day, and the prospects are that it will be run to its full capacity during the coming season. Beer bottled by them keeps in any climate and for any length of time. It is warranted pure and is pronounced to be of the best quality and flavor by thorough judges of beer. Judging from the showing of this firm, we predict that the time is not far distant when more bottled beer will be sold than keg beer, on account of the manifest advantages it possesses.

GRAIN FOR MILLING.

AN ESSAY READ BEFORE THE PENNSYLVANIA
STATE MILLERS' ASSOCIATION, AT LANCASTER,
JANUARY 14TH, 1879, BY ANDREW M. GAR-
VER, ESQ., OF SALUNGA, LANCASTER CO.

[Revised by the author for the United States Miller.]

This is a subject of noble import, as the milling business occupies a large and respectable portion of our National industries, and gives employment to a large investment of capital in all the principal wheat-growing States of the Union, and which contributes largely to the benefit of our American farmers in making a home market for wheat, the principal American staple product. It embraces an extensive field of labor for the scientist, the agriculturalist and the practical miller. It is a subject of more than ordinary interest to the wide-awake American miller, for it is as important for the miller to have a theoretical knowledge of the quality of the grain he buys and grinds, as it is for the physician to know what to prescribe for the alleviation or cure of a certain malady or disease. The quality and quantity of grain should, at all times, maintain a price that would produce the results, both for the manufactured article, and to leave the best margin for the miller.

As there is no country on this globe which is so well adapted to the cultivation of wheat as the fertile soil of America,—the quality of which seems highly impregnated with those nutritious substances so necessary to the production of this grain,—consequently the high reputation which American breadstuffs sustain in foreign markets enables the millers of this country to out-rival all competition in the manufacture of flour, either in quality or quantity, as the surplus amount of grain annually grown in the United States bids fair to exceed the entire product of all the European dependencies. Not many years ago (and as late as the year 1830), large quantities of grain were imported from Europe to the United States, and sold to good account.

Wheat, the article from which the principal breadstuffs of America and most of the European countries is manufactured, takes precedence over all other grain, and comes to us from the East, as well as all other cereal grasses, but it has been so much changed and improved by culture, that its connection cannot be satisfactorily traced to any species of the genus now known to be growing wild. The wheat that produces the largest amount of flour and of the best quality is certainly the most profitable for the miller, but at the same time he must know for what trade he is making flour—whether for the baker, family use, the starch factory, or the paste-pot. As wheat is composed of water, gluten, starch, gum, sugar, oil and other substances,—gluten and starch forming the two principal elements of flour,—wheat that contains the largest per cent of gluten and starch proves to be the most profitable both to the miller and consumer. The baker will always buy the flour that contains the largest per cent of starch, as this element in flour is the one that expands, and, by its nature, is dry; more water can be added, and the result is more pounds of bread to the barrel.

As the yield of flour depends on the species and quality of wheat (which millers are all, more or less, acquainted with), the wheat that weighs the heaviest does not always make the most or best flour. As a general thing wheat known as the Mediterranean exceeds in weight all others except the Fultz, and that yields well enough in quantity, but not in quality, as flour from this wheat is darker, which, consequently, makes darker and rougher bread, and, therefore, is not advisable to grind alone, either for baker's or family use. In my experience in grinding wheat, I find that by taking the following proportions: one-third Fultz, one-third Red and one-third Amber, we are able to make a good quality of flour and also an excellent yield. These are the principal kinds of wheat raised in our section of the country. I would not recommend the grinding of the Fultz alone. It would be to our in-

terest as millers to encourage the farmers to raise the Red and Amber, or such other species as yield well for the farmer, and at the same time produce a good quality of flour. Again, to be a fair judge of grinding wheat for flouring, the miller must be endowed with one of the five blessings or senses with which nature has bestowed upon mankind generally, that is, an acute sense of feeling, for, without this sense, the miller is destitute of a guide to grind wheat for merchant work in such a manner to realize the greatest possible amount of flour from the wheat. As it requires but an alteration of two degrees to make a difference of from one to three pounds of flour in the bushel, so it is in the different qualities of wheat which the miller may have to grind, as some qualities of wheat will grind from one to five degrees closer than other kinds, owing first, to the order that each sample may be in when ground, and secondly, to the particular species of wheat. All these causes must be examined by the miller, and he will then be prepared to form a correct judgment as to how close the stone requires to be set on each kind of wheat.

The purchase of wheat is another subject of importance both to the miller and farmer. The standard weight of wheat is held at sixty pounds per bushel of thirty-two quarts, but, so frequently does it lack in weight, that, to remedy this defect, the farmers have learned to give the bushel measure an extra shake or two, or believe they can make good measure by pressing down and striking and running over, so that the weight compares more favorably with the measure. This so frequently causes disappointment to both miller and farmer, that some plan is rendered necessary for the protection and benefit of both parties. In some of our milling establishments a rule of dockage is practiced. For every pound that the measured bushel falls short of sixty pounds, one pound is added to make up the shrinkage. This plan of dockage I should not recommend, because it frequently causes dissatisfaction among farmers wherever the system prevails. To prevent the difficulty, I would recommend the miller to deal in this respect as the merchant does in the articles of cloth, calico, or any other kind of goods whose value is fixed according to its quality. This I would deem the true and only rule that merchant mills should follow.

The last, but not least, fact, that stares us in the face, is that wheat is frequently worth more in the market than flour is. This fact is one that is very forcibly brought to the minds of millers in all sections of this country. We are at present passing through an ordeal of this kind, wheat being worth from \$1.00 to \$1.08 per bushel, while flour is quoted at \$4.50 to \$4.75 per barrel in our market. Considering the expense of grinding, shipping, commissions, etc., the margin in the miller's favor is very slim. Many of the flour mills have run down, some have stopped altogether, and others are only busy a few months in the year. We raise millions of bushels of grain every year, and it is exported in an unmanufactured condition, while the mills and millers in foreign countries perform the labor and make the profit which ought to be ours, and, by the passage of proper laws, can become ours. At present there is no export duty on breadstuffs of any kind, either in a manufactured or unmanufactured state, and the consequence is, that the large amount of breadstuffs shipped to Europe are in an unmanufactured condition. Foreigners buy our wheat in preference to flour, not because they are making a better article of flour, but because they want to reap the benefit of manufacturing it themselves.

What is the remedy? I suggest that the quickest and best way to change this state of affairs would be to put an export duty on wheat, and let flour go out from American ports duty free. This would give employment and profit to American millers in manufacturing our own wheat into flour. This would not only be to the interest of the miller, but the whole American continent would be benefited by it. This is a matter of great importance to American millers, and a subject that should be discussed and acted upon by our various milling associations, and, if after due discussion, it should be considered prudent and advisable, our members of Congress should be urged to secure the passage of a law putting on the export duty.

The produce statistics of Nebraska for 1878 are given as follows by Professor Wilber: 26,000,000 bushels of wheat, 46,000,000 bushels of corn, 9,000,000 bushels of oats, 3,000,000 bushels of rye, 3,000,000 bushels of barley, 3,000,000 bushels of potatoes; 500,000 cattle, valued at \$7,000,000; 600,000 swine, valued at \$5,000,000.

DOES THE MODERN SYSTEM OF MILLING PAY?

A Subject that will Bear Considerable Discussion.

[Special correspondence of the United States Miller from Scotland.]

In relation to a heavy percentage of middlings one wonders at the ideas often put forth by those so-called scientific millers. One favorite idea with them is that soft requires less fare than hard wheat, which shows that the difficulty of bran cleaning or flour detachment from the bran with mild pressure has never entered their heads. It is all very well on a superficial view to say: take off the bran first, making as little flour during that process as possible, and then the remainder will all be first-class. They seem to forget that the grand difficulty with the miller is the detachment of the flour from the bran, without cutting the latter too much up or injuring the flour by too much compression. The necessity of having a certain medium of cutting and crushing must always be taken into consideration with the flour miller, however high or low the grinding, as he cannot get quit of the difficulty of bran cleaning; and whether wheat is reduced to flour by one or several regrindings, the same consideration must always prevail at the end, for produce and quality combined. The larger and cleaner the bran is, the less loss and difficulty in separation; and the more the bran is pulverized at the end of one or several regrindings, the more expense will be incurred for sifting or separating surface to attain a certain standard purity for a straight grade, or the average of several grades, and local circumstances must always have a ruling influence as to whether clean or heavy bran, or one or several flour grades will pay best.

Now, experienced millers know that as the wheat gets softer, the more difficulty they have in cleaning the bran and at the same preserving a necessary freeness of flour for handy baking and good fermentation. The softer the wheat, the larger the larger the granules have to be and the greater the distance between the stones to preserve the necessary freeness, and with such wheat the miller aids the cleaning as much as possible by keen-edged cracking, so that he gets clean bran and free flour at the same time; but except he has extensive face rubbing, this cool light-pressure grinding won't clean the bran. This cool grinding with large stone face had to be carried to the extreme in Britain with its humid climate and damp wheat.

As a type of the other extreme of grinding the ancient Egyptian is a fair sample, as his wheat was harder than that of California, Kansas, or Colorado. Nearly all his wheat could be reduced to flour and the bran cleaned without any rubbing at all, as by simply striking it repeated blows it breaks off without compression. Some Hungarian mills also crush the most of the flour off without any differential speed of rollers. Then say the British or North Europeans had attempted the Egyptian mode of reduction! They would have just pounded the greater part of the flour and bran into an inseparable mass, totally spoiled for immediate fermentation. A gentle rub over a 9-inch face, with lands and furrows about equal in breadth was reckoned sufficient by the British for good flour and produce, but the Egyptian could do without any rubbing at all. His wheat could be broken nearly as small as the thickness of the bran without compression of the particles taking place.

It will be evident, then, the harder the wheat the more violence can be employed to crush it down on a smaller face, and one of the inexorable laws of nature likewise aids him in this with stones. It has been found from long experience that the damper the grain the lower a kiln heat requires to be, all of the earth's productions seeming to rebel and change faster on a sudden combination of great heat and excessive moisture, and a stone heat which would affect the Egyptian but little would spoil the British for good fermentation from the suddenness of the application of heat in the stone. Now, hard wheat can be broken or ground down to very small particles and yet feel sharp and gritty, or sandy, although many times smaller than the flour of soft wheat which feels quite soft. It thus requires an exceeding true stone face, with skillful designed furrowing, to prevent irregular grinding in grinding down at once. As the closer the stone the quicker is the bran cleaned. With a large number of hard wheats the flour particles have to be so small to prevent over freeness or grittiness, that bran cleaning has never to be taken into account and no stone cracking or artificial edges required at all. And the more unskillful the miller the more face required, and the more the bran is unnecessarily rubbed and pulverized, and the flour polished deteriorating its strength. And the skill of the miller is shown when he attains the best results with hard wheat with the least grinding or rubbing surface, and those who require a larger face for hard than for soft wheat must be unskillful millers.

UNITED STATES MILLER.

PUBLISHED MONTHLY.

OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.
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MILWAUKEE, MARCH, 1879.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

THE UNITED STATES MILLER has now entered upon its sixth volume, and has become universally acknowledged to be one of the most valuable milling journals in America, both for the purpose of transmitting knowledge on milling and mechanical subjects and as an advertising medium for introducing and selling all kinds of modern milling machinery. It is our aim to meet the wants of our patrons, whether manufacturers or consumers. Our editorial course will be entirely independent, and we shall do our best to give our readers the benefit of the latest important news on subjects pertaining to the objects of this paper. Our circulation and advertising patronage cover all sections of the country. We do not deal in machinery ourselves, and consequently have no "axes to grind." We cordially invite all those who have already patronized us to continue their patronage, and those who have not to try our columns. We append herewith our

ADVERTISING RATES FOR 1879.

	1 mo.	2 mos.	3 mos.	6 mos.	1 year.
One inch card.....	\$ 2 00	4 00	5 50	10 00	20 00
Two.....	4 00	8 00	11 00	20 00	40 00
Four.....	6 00	12 00	16 50	30 00	60 00
One-half col. (8 inches).....	10 00	20 00	30 00	60 00	100 00
One-fourth page.....	20 00	40 00	60 00	120 00	200 00
One-half page.....	40 00	80 00	120 00	200 00	400 00
One page.....	100 00	150 00	200 00	400 00	800 00

Size of page, 12x18. Length of column, 16 inches. Width of column, 2 1/2 inches; 4 columns to each page.

Business editorial matter per line, 30 cents. If over 50 lines, 25 cents.

Illustrations charged for in proportion to space occupied.

Advertising for Millers wishing situations, or millers wanting to engage employees, 50 cents.

MILL FOR SALE advertisements, \$2 each insertion.

We have recently published a *List of Names and Post-Office Addresses of the Flour-Mill Owners of the United States and Canada*, which is of great value to those who desire to communicate by circular with American mill-owners. The price is \$5 per copy, post paid. Cash must accompany the order.

We have also lately published a *New and Planing Mill Directory of the United States and Canada*. Price, \$5.

Subscription price to the UNITED STATES MILLER, \$1 per year.

M'Lean's Millers' Text Book, which every miller should have. Price by mail, 60 cents, post paid.

Ropp's Easy Calculator, which every business man should have in his pocket or on his desk. Price by mail, post paid, \$1.

Our Job Printing Department is one of the finest in the State, and particular attention is paid to all kinds of commercial work, which we can do on the most reasonable terms. Parties desiring to publish catalogues, circulars, etc., should send for estimates.

Address all communications to the
 UNITED STATES MILLER,
 62 Grand Opera House, Milwaukee, Wis.

EVERYTHING seems to be adulterated now-a-days except oysters and eggs and Limburger cheese, and they often outlive their usefulness.

A MINNEAPOLIS baby born last Sunday had five teeth, a fine head of hair and weighed with its wrappings just one pound and a quarter.—N. W. Miller.

New process—eh, Hoppin?

AN INVITATION.—We cordially invite all millers, millwrights, millfurnishers and inventors of milling machinery to call on the UNITED STATES MILLER when visiting this city.

We hereby return thanks to Hon. S. D. Fisher, Secretary of the Illinois Department of Agriculture, for copies of his report for the year 1878. It has been prepared with great care and labor, and is a work of value.

THE UNITED STATES MILLER has the largest circulation of any milling journal published in America, and was the first milling journal started in America entirely independent of connection of interest with some machine or mill-furnishing establishment.

We publish in another place a communication from the Executive Committee of the Millers' National Association. Messrs. Collins & Gathmann, the well-known Chicago manufacturers of the Garden City Middlings Purifier, well deserve the compliment therein conveyed. All manufacturers of middlings purifiers, except the Geo. T. Smith Company of Jackson, Mich., are to a certain extent interested in the success of the millers in the present St. Louis cases, and this timely liberality on their part is highly commendable. Other manufacturers

who seek the patronage of millers would do well to follow their example. No expense should be spared to secure a final and just result.

AMERICAN plumbers generally know how to charge enough for their services, but here is an extract from a French plumber's bill that deserves their attention:

To searching for leak in gas pipe....2 francs
 To finding it.....3 francs

MR. J. B. McFAIL, of Vassar, Mich., has sent us his circular describing his compound and method for patching bolting cloths and specimens of work done. It is a good thing and will no doubt soon be in use universally for the purpose intended.

THE PLAGUE AND GRAIN TRADE.

The effect of the Russian Plague on the American grain trade will undoubtedly be considerable. Commerce is practically stopped between Russia and the rest of the world for the present, and such being the case, America must necessarily make up the deficiency caused by the sudden stoppage of the usual large exports from Russia. The meager reports which the press is able to obtain of the true condition of affairs in Russia indicate that this visitation is truly dreadful. The ravages of the yellow fever in our own Southern States during the summer of 1878 are said to be insignificant in comparison with the frightful fatality of the plague in Russia. If these reports are true, there is no doubt of a steady advance in the price of wheat.

FISHWAYS.

We have just received a copy of the report of the Wisconsin Fish Commissioners in which they call special attention to the absolute necessity of having fishways in mill dams. They ask the State Legislature to enact laws to compel mill-dam owners to construct fishways with a penalty for neglect of so doing within a reasonable time, or if this is not deemed advisable they urge that the law should provide for their being erected at public expense, as the successful culture of fish is otherwise impossible. We believe most mill-dam owners are willing to put in fishways without being compelled to do so. The Commissioners have a plan of an efficient and cheap fishway. The result of the labors of the Wisconsin Fish Commission since its organization in 1873 is highly satisfactory.

IMPORTANT NOTICE.

TO THE PARTY RECEIVING THIS PAPER WHO IS NOT ALREADY A PAID SUBSCRIBER.

We hereby extend to you a cordial invitation to become a subscriber to the UNITED STATES MILLER. We shall endeavor to make it of the greatest possible use and benefit to the milling fraternity, and no mill should be without it. The best talent that we can obtain in this and other countries will contribute to its columns, which will also be enriched by carefully translated articles on subjects of interest to the craft. To those who will send us One Dollar in thirty days from date of this notice we will send the UNITED STATES MILLER from March 1st, 1879, to May 1st, 1880. Enclose money or stamps in an envelope, seal carefully, and send at our risk. By return mail you will receive a receipt therefor. Address

THE UNITED STATES MILLER,
 March 1st, 1879. Milwaukee, Wis.

ORDER AND CLEANLINESS IN FLOUR MILLS.

If there is any manufacturing place in the world that ought to be kept absolutely sweet and clean and everything therein in order, it is the flour mill, and yet we confess to having seen many mills which were totally the opposite. Bags, bran, offal, tools, old coats, horse blankets, flour and many other things lying about in universal confusion, the miller and his help probably smoking their pipes or chewing tobacco and spitting in the place that came handiest. These same millers would feel themselves outraged and imposed upon if their wives should keep their kitchens in such a deplorable state of dirtiness and confusion. There is as much sense in keeping one in order as the other. This fault is most frequent in custom mills, although we have seen some merchant mills which could bear a wonderful amount of improvement in this respect. The flour mill should be always kept perfectly clean, and tools and material always in their places except when in actual use. No smoking or chewing of tobacco should be allowed, and employees should keep their hands and clothing as clean as the baker is supposed to. The manufacture of flour is a

neat, clean, pleasant business, if properly carried on, and cleanliness is of pre-eminent importance. In a well ordered mill it is scarcely necessary to get the clothing soiled even with flour dust.

AN INTERESTING COMMUNICATION.

Editor United States Miller:

The Executive Committee of the Millers' National Association acknowledge the receipt of \$500 from Messrs. Collins & Gathmann, of Chicago, proprietors and manufacturers of the Garden City Purifier, as a voluntary contribution towards defraying the expenses of defending suits brought against the millers by Cochran and others, and we take pleasure in publicly thanking these gentlemen, because it is due to the millers to know their friends among the vendors of mill machinery.

Their liberality while doubtless prompted by a recognition of the fact that while we are defending ourselves we are also fighting their battle to some extent certainly strongly recommends them to the liberal patronage of millers everywhere, besides the fact that their machines have undoubted merits and are offered at moderate prices, and last, not least, because they are reliable, responsible and liberal gentlemen.

J. A. CHRISTAIN,
 ALEX. H. SMITH,
 J. A. HINDS,
 S. H. SEAMANS,
 Sub-Executive Committee.
 GEO. BAIN, President.

St. Louis, Feb. 14th, 1879.

ALWAYS TURN THE CRANK THE RIGHT WAY.

Years ago, when the Connecticut Legislature used to hold May sessions, a member of that body invented a "shad boning machine," which was operated by means of a crank. When the weary members had awakened from their morning nap, brought on by the monotonous debate, a grand rush was made for the dinner table, and each member provided with a shad and a machine, seized the crank and as it turned, the bones flew over the eater's head, and the toothsome portions of the fish were nicely deposited within his distended jaws. The machine was voted a success, and a large subsidy was talked of in the lobby. But the course of the "shad-boner" was not destined to run smooth. One day an unsophisticated member turned the crank the wrong way, the fish flew over his head and the bones filled his mouth and throat till he resembled a living pin-cushion for a few moments, and he finally took his departure from Connecticut to the better land. The inventor was ruined, the machines sold for old iron, and the primitive mode of eating shad with the fingers prevails unto this day.

INCREASE OF THE RUSSIAN EXPORT TRADE.—According to the Moscow correspondent of the *Cologne Gazette*, the Russian export trade, with all the disadvantages of the recent war, has more than doubled during the last ten years. In 1868 Russia exported to the value of two hundred and nine and a half million roubles to Europe; in 1877, 508,000,000—viz., corn, 264,000,000; flax, 63,000,000; linseed, 22,500,000; wool, 22,000,000; wood, 31,000,000, etc. The export of gold during the same period was 19,000,000, and the import 11,000,000; the total imports, including Asia and Finland, being 321,000,000.

Special Business Notices.

Do you need a good Saw Gummer or Saw Tooth Swage? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

NOTICE.—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

IMPORTANT TO MILLERS.—The necessity of the most positive uniform speed in the motive power of flouring mills is generally conceded. The unprecedented results in way of positive regulation of engine, durability and great economy in use, now guaranteed by the Huntton Governor Company, are worthy the consideration of all who may use steam power. See advertisement.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to Nordyke & Marmion Co., Indianapolis, Ind.

NOTICE.—The milling public are hereby notified that we have discontinued all suits against Messrs. E. P. Allis & Co., for infringements of patents on the Cockle Separator, manufactured by us, and the said firm of E. P. Allis & Co. will hereafter sell our machines on same terms as other mill furnishers, or the undersigned.

COCKLE SEPARATOR Mfg Co.

Milwaukee, Dec. 27th, 1878.

MILL PICK WORKS OF HENRY HEEZER, No. 456 Canal street, Milwaukee, Wis.—To the Milling Public: Having this day dissolved partnership with the firm of H. & J. Horner, I hereby respectfully announce that I have removed to No. 456 Canal street, where I am ready to receive orders for manufacturing and repairing mill picks, tools and all specialties in my line. My work is well known through the country, and I do not hesitate to guarantee perfect satisfaction to all parties favoring me with their orders. Address

HENRY HEEZER, No. 456 Canal street, Milwaukee, Wis.

NEW PATENTS.

The following patents were issued from the United States Patent Office for the week ending January 7th, 1879:

Barrel-truck, Elvin D. Sterling, Rock Falls, Ill.
 Pump-valve, Geo. S. Bartlett, Leon, Iowa.
 Bag-fastener, Thomas Cleary, New York, N. Y.
 Steam-motor, Thomas B. Fogarty, Brooklyn, N. Y.
 Barrel, Garder & Butterfield, Milwaukee, Wis.
 Grain-binder, James F. Gordon, Rochester, N. Y.
 Middlings-separator, Lawrence Kleunn, Terre Haute, Ind.
 Boiler-attachment, George Kratz, Evansville, Ind.
 Straightening millstone face, Wm. Lehman, Milwaukee, Wis.
 Crushing-roll, Peters & Gardiner, Brooklyn, N. Y.
 Oatmeal-machine, George W. Severance, Ravenna, Ohio.
 Steam-generator, Geo. B. N. Tower, Cambridge, Mass.
 Grinding-mill, A. H. Wagner, Chicago, Ill.
 Bag-fastener, John H. Wilhelm, Denver, Colo.

The following patents were issued the week ending January 14th, 1879:

Roller apparatus for crushing and grinding grain, Wilhelm Braun, Carlsbad, Austria.
 Grinding-mill, Christian Custer, Philadelphia, Pa.
 Feed-water heater, Horace C. De Torres, Turin, Italy.
 Wind-mill, Wm. Frazier, Centralia, Ill.
 Feed-water purifier, Sam. J. Hayes, Chicago, Ill.
 Barrel-machine, Sam. P. Hodgen, Martling, Mo.
 Stuffing box for steam engines, C. C. Jerome, Chicago, Ill.
 Engine-governor, Chas. S. Locke, Chicago, Ill.
 Steam-boiler, Josiah M. Simpson, Oshkosh, Wis.
 Grain-conveyor, Wm. T. Smith, New Lots, N. Y.

The following patents were issued January 21st, 1879:

Corn-planter, Jarvis Case, Dayton, Ohio.
 Middlings-separator, G. H. Doane, Detroit, Mich.
 Corn-planter, Ezra Emmet, Franklin Grove, Ill.
 Grain-separator, Jas. F. Hatfield, Dublin, Ind.
 Bran-duster, Chas. A. Lawton, Depere, Wis.
 Repairing bolting cloths, John B. McFail, Vassar, Mich.
 Wind-mill, Henry M. Underwood, Kenosha, Wis.
 Machine for sorting and cleaning semolino, Jacob Werner, Budapest, Austria.

The following patents were issued January 28th, 1879:

Middlings-separator, William P. Anthony, Chambersburg, Pa.
 Feed-water heater, Chas. F. Barrett, New York, N. Y.
 Wind-mill, Julian R. Dixon, Fresno, Cal.
 Barrel-hoop machine, John B. Dougherty, Rochester, N. Y.
 Engine-oiler, Edwin M. Humstone, Edgeville, Tenn.
 Grain-register, L. C. Ives, Indian Creek, Va.
 Rotary-vacuum engine, Lor. B. Lawrence, Monticello, Cal.
 Feed-water heater and boiler regulator, James Pool, Friendsville, Ill.
 Middlings-separator, Wm. A. Reimers, Mankato, Minn.
 Cut-off, Wm. Sims, Ripley, Ohio.
 Wind-mill, Geo. W. Sword, Lanark, Ill.

The following patents were issued February 4th, 1879:

Turbine water wheel, Albert Ball, Clasement, N. H.
 Grinding-mill, Teman Bowman, Alum Wells, Va.
 Hulling-machine, Norman Hutchinson, North East, N. Y.
 Barrel-trussing, Horace W. King, Alden, N. Y.
 Grain-separator, Henry H. May, New Albfon, Iowa.
 Mill-staff gage, John Miltenberger, Peru, Ind.
 Threshing machine and separator, Robt. H. Montiehl, Eau Claire, Wis.
 Yeast substitute, Wm. Stewart, Portsmouth, Ohio.
 Grinding-mills, A. H. Wagner, Chicago, Ill.

IMPROVED METHOD OF MANAGING STEAM BOILER FIRES.—When the furnace door of a steam boiler is opened, there should be a simultaneous partial closing of the damper to prevent sudden chilling of the boiler and flues. To accomplish this with certainty for every opening of the doors, Mr. William Weightman, of Powers & Weightman, has had arranged and applied a system of levers and rods, connecting the furnace doors with the damper, so contrived that whether there be one or more doors to one furnace, or to which one damper is supplied, the act of opening any one door will invariably close the damper. Whether this application of simple and ingenious devices is new or not, every engineer will regard it as one of the good things for aiding the better management of steam boilers.

OUR PENNSYLVANIA LETTER.

Something About Oil.

[Special Correspondence United States Miller.]

OIL CITY, Pa., Feb. 15th, 1879.—Probably no other important industry of the United States has undergone so many remarkable transitions as that of petroleum production, manufacturing and transporting. Ever since the day when Col. Drake discovered the oleaginous compound oozing from the rocks in the ravine, near the present beautiful and metropolitan-like city of Titusville, up to this date, has there been more or less commotion in the interest which now ranks third in importance, extent and value of American commodities. Owing to the speculation, that is always certain to become connected with the discovery of anything new and of universal and manifold usefulness, enterprise after enterprise, and combination after combination has been originated by shrewd and calculating capitalists to grasp and monopolize the various interests that are a part and parcel of petroleum and its products. The first of these schemes to control the production, storing, transporting, refining and marketing of oil, was the organization of the South Improvement Company, which occurred in the early days of the discovery of petroleum. All of these associations and corporations for the manipulation of the oleaginous product soon, however, met with disaster and crumbled to pieces. The only corporations which managed to hold out against all odds were the "pipe-line" companies, whose lines of pipe carried the crude oil from one point to another in the producing centers, and then finally conveyed it to the railroads, which traverse the regions, for shipment in iron tanks mounted upon platform cars. The pipe-line companies also erected many great iron tanks of immense capacity for storing oil. The principal pipe companies are the Pennsylvania Transportation Company,—of which Cook & Harley were the originators,—the United Pipe Line, the Union Pipe Line, and the Columbia Conduit Company's Line. The latter concern was originated by Pittsburgh capital and the oil was mostly carried, and still is shipped to the seaboard, by the Baltimore & Ohio railroad, it being taken via the Pittsburgh & Connellsville route to Baltimore. Some of the crude material also goes to Parkersburg, West Virginia, where it is refined at the works of the B. & O. R. R. Co.

The petroleum operations have frequently jumped from one place to another, in consequence of the exhaustion of the greasy compound. The Crawford county "oil belt" soon depreciated after its finding, and the mushroom cities and towns, which had sprang up as if by magic in the times when Crawford county was the scene of busy petroleum operations, rapidly fell into insignificance, and finally disappeared from existence altogether. Perhaps in no other section of the country can the foot-prints of time be so readily recognized by the changes which are everywhere apparent. On the twenty-eighth day of August, 1859, Col. Drake first struck oil near Titusville. This was twenty years ago, and yet in that comparatively short space of time colossal fortunes have been realized and lost by some of the "oil kings and princes" no less than a dozen times. Men have retired at night almost penniless and awoke in the morning millionaires. Others have come here with large fortunes and squandered them in opening what proved to be nothing but "dry holes," and unremunerative business ventures. It has been alternately up and down with them, and no one could reasonably ask for more variety. Some of the original land-owners, who sold out to the oil seekers at the inception of the petroleum excitement, occasionally returned. As they visit the homely and dilapidated old log cabins, now deserted and unused, but which, in days of yore, were their places of abode,—places in which by far the happiest days of their lives were passed,—their feelings are such as can hardly be expressed.

As is generally known the original oil field was in Venango county, between Titusville and Oil City, along the banks of Oil Creek, a miserable, winding stream, and one of the feeders of the Allegheny River. The oily scum that floated upon the surface of the creek led to Col. Drake's discovery, although the compound was known to exist during the days when the aborigines inhabited that section of Pennsylvania. The Seneca tribe of Indians and the soldiers of the revolution were in the habit of anointing their wounds with oil which was found oozing from the crevices of the rocks, they finding the curative powers of the material excellent and infallible.

For several years it did not occur to anybody that petroleum could be found in any other locality. As soon, however, as the importance of Col. Drake's discovery became known, as but a natural consequence, the development on Oil Creek was rapid, and oil towns sprang up rapidly. When the Oil Creek railroad was built, nearly every man across whose land it passed demanded that, in consideration of the right of way, a depot be built upon his farm. This was productive of the formation of numerous towns. Thus in going south from Titusville, the traveler and oil prospector found Miller Farm, Stauffer Farm, Foster Farm, Funkville, Egbert Farm, Petroleum Center, Storey Farm, Tan Farm, Rynd Farm, Rousseville, McClintockville, and others, all in a distance of less than twenty miles. Some of these places have now wholly disappeared and only a few old, tumble-down, and deserted buildings remain to mark the locality of others. For an illustration, take Petroleum Center: fifteen years ago it was, as its name implies, the center of the petroleum business. There were numbers of houses, machine shops, hotels, stores, a handsome opera house, churches, etc. The population in 1866 was about 6,000 or 7,000 persons, and at night (which is always the busiest time in many places in the oil country) it was almost impossible to pass through the streets in consequence of the great crowds of people seeking different kinds of amusement. What an extraordinary change! Nothing can be compared to it except the destruction of war or a scourge. Instead of the locale of fine residences, the ground is now used for potato patches, but crops of any kind are never very large, as the ground is rocky and unsuitable for raising any kind of produce. The churches, in some instances, yet stand, but nobody remains to attend them. The population is now less than one hundred.

A short distance north of Petroleum Center, where Dublin, a town of 600 inhabitants was, not a house remains. Pithole is another place remarkable for its rapid rise and fall. At one time it had a population of between 10,000 and 15,000. This fair number has fallen to about fifty persons, all told. To more strongly show how Pithole has depreciated, a single illustration will suffice. The place during its palmy days supported mammoth and elegant hotels, a large and beautiful opera house, printing offices, churches, and similar institutions for secular and religious purposes. Recently \$25,000 was bequeathed to the Pithole church by Mr. C. B. Duncan, who died in Glasgow, Scotland, but who amassed an immense fortune in oil operations when the petroleum business was at its zenith in Venango county. During the litigation which followed, a committee was sent to Pithole to find the church, but found upon investigation that not a vestige of the edifice remained to mark the spot where it had once stood. There was no one left to take care of the building, and it had gone to decay. This is but one authentic illustration of how the hand of demoralization has wrecked other institutions and establishments that originally cost fortunes to construct.

It is the same throughout the entire lower oil field. The towns of Cash-Up, Dead-Broke, Plumer, Slambang, Black Hills City, Modoc, Greece City, Turkey City, Devil's Rancho, Buzzard's Roost, and other hard-named places, are either totally obliterated or remain shadows of their former greatness. Passing down Oil Creek the scene presented is one of desolation and loneliness. THE UNITED STATES MILLER correspondent was connected with a daily newspaper published here during 1870-71, when Oil City and the surrounding oil centers were in their prime. Everything was in a flush, lively and busy condition then. The transition since then is wonderful. Where was once life, business ambition, and excitement, now remain only old derricks, tumble down engine houses, and wasted dwellings. Widow McClintock's son, Johnnie Steel, known throughout the United States as "Coal Oil Johnnie," lived near here, and I was well acquainted with him. He awoke one morning the possessor of over a million and within a year's time squandered it all. Johnnie acquired the name of the "great American spendthrift." He visited hotels, purchased them, and presented them to some of the loungers hanging around; he bought the Grand Opera House, at Meadville and the whole elegant granite block of buildings in which the establishment was, one day, and gambled the entire property away the same night. Johnnie also organized Skiff & Gaylord's minstrels, gave each member a \$6,500 diamond bosom pin, and went traveling through the country. Shortly after this he became ruined, and then acted as door tender for the troupe. Yet with

all these extravagant things, Steel did not spend nearly so much money as was stolen from him by the parties with whom he associated.

As the petroleum became exhausted in Crawford and Venango counties, the operators began to drift down Oil Creek, but as nothing very rich was struck at any of the points visited, the Butler county region was tapped. Here the oil men struck a bonanza for a time, and Parker's Landing, a tie-up place for flat boats, on the west side of the Allegheny River, soon grew into Parker City, and such places as Millerstown, Petrolia, and other towns, soon became largely populated, and all was life for a time, but as the oleaginous fluid ran out, the operators, seeking for "fields more green and pastures new," got into Clarion, Armstrong, Warren and Foster counties. Some very rich strikes were made at several of the new oil towns, a number of 2,000-barrel wells being opened, and, in one instance, in the Bullion district, a 5,000-barrel spouter was struck. The "Great Medicine" and "Big Chief" were also large producing wells. These immense strikes were only made about two years since, but, while production is still going on, the product has very materially diminished. But the greatest bonanza was left for the petroleum producers in the McKean county or Bradford oil districts. This region is the most prolific of any yet opened, and as the oleaginous compound appears to be inexhaustible, it looks as if the business was going to be a permanent thing in McKean county. This section of the State was, a year since, a wild-cat country, and the smallest populated. Now it has a vast permanent and transient population, and is blossoming like a rose.

On the first of this month there were 361 well-rigs up in the Bradford district, as many more scattered through McKean county, besides 240 wells which were in various stages of drilling. Many of these have nearly reached the petroleum, and will, in all probability, be in operation when this is published. The daily petroleum production of the entire region is about 38,275 barrels, the pipe-line runs being about 25,000 barrels per day. The entire product of all the regions, embracing the middle oil field of Venango, Crawford, Warren and Forest, and the lower field of Butler, Armstrong and Clarion, is put at 45,000 barrels per diem. The reports of the different pipe-line companies show the daily average of shipments in the past month to have been 21,103 barrels, and the total shipments of the month to have been 654,221.95 barrels, a decrease of 124,219.95 barrels from the shipments of the same month last year. The amount of stock on hand at the end of January was 5,064,693 barrels, and the average daily runs at the same time were 44,719 barrels. The reports also state that the amount of oil in the United States at the close of January represented by outstanding certificates and other vouchers was 2,153,768.83 barrels. The value of the accumulated stocks is estimated at between \$15,000,000 and \$20,000,000.

A bitter war is in progress between the individual producers, shippers and refiners,—who are, apparently, backed by some insignificant railroad companies,—and the Standard Oil Company, of Cleveland, Ohio, for supremacy in the petroleum trade. The producers have formed what is called the American Petroleum Company, an organization which is intended to start a warfare with the Standard Oil Company. A paper published in the region estimates that there is sufficient oil held and controlled outside of the Standard Company to manage the demand and supply beyond any effect that this corporation might have. It is claimed that the grand total held by the producers, etc., is 8,830,000 barrels, while it is also said that certain dealers, who carry from 1,000 to 1,500 barrels, would swell the purchasing capacity to at least 10,000,000 barrels.

This entire statement is very much doubted by your correspondent, as from what he has learned by a close investigation in circles that are supposed to be well and reliably informed upon the subject, it would seem the supply of the crude material held, owned and controlled by the Standard Oil Company and its connections is considerably over and above the quantity in the possession or handled by other parties, whether their product is inside or outside of the regions. I think that I am sufficiently well acquainted with the people of the oil country to know the fact that, in their greed for gain, they have, unfortunately, overreached themselves in troubling the Standard Oil Company.

This corporation, with John D. Rockefeller, as President, is one of the wealthiest, most influential and enterprising concerns in America.

The Standard has a capital stock of \$3,500,000, and transacts a heavier business than any other American oil firm. The principal refining works of the company are located at Cleveland, and the superior and celebrated products of the company are sent to all parts of the civilized world where oil is used for illuminating, lubricating and other purposes. The Standard Company have their regularly appointed agents in all parts of the country, and their daily transactions are enormous. The old established, reputable and highly honorable firm of Warden, Frew & Co., of 305 Walnut street, Philadelphia, Pa., are among the representative agents in this State of the company. The Messrs. Warden, Frew & Co. have an extensive petroleum refining establishment at Point Breeze, near Philadelphia, while the Brilliant Oil Works, at Pittsburgh, Pa. (Lockhart, Frew & Co.), besides other concerns, are operated by the same firm. The Atlantic Petroleum and Storage Company is also a first-class and reliable connection of Warden, Frew & Co. As all the principal oil men and refiners of the country are working in the favor of Mr. John D. Rockefeller, and the Standard Oil Company, it would certainly seem that those parties who have assailed that gentleman and his corporation have made a serious, if not fatal, mistake. Without preference or prejudice I do not regard the Standard Oil Company as a monopoly by any means, but, on the contrary, rather consider that, by the enterprise and distribution of ample means among a large number of operatives and the systematizing of an excellent manufacturing business, and the production of an entirely indispensable article of light and heat, Mr. John D. Rockefeller, the members of the Standard Oil Company, and Messrs. Warden, Frew & Co., and the other representatives of the corporation, are public benefactors to the people who can understand and appreciate the benefitting influences that have been conferred upon them. No, the Standard Oil Company is no more of a monopoly than your journal is. The paper occupies an influential sphere, and wishes to secure the largest circulation and influence that can be obtained by legitimate, honest, and respectable means, and that is the same way with Mr. John D. Rockefeller, his associates, and the Standard Oil Company, and, just so long as a legitimate, conscientious and upright course is pursued by the gentleman, his corporation and connections all over the country, just so certain is the favor of the people to be obtained. Yours truly, W. A. E.

MACARONI.

This nutritious and wholesome article of food is little used in this country. In Italy, however, its use is universal, often constituting the principal food, and taking the place of fish, vegetables, and the meat generally in the regular dinner. It is also sold and eaten in the streets as freely as fruits are with us. Its use is extensive in France and Germany.

It consists of pure gluten, which element constitutes only three and one-half per cent of wheat flour, and is wholly wanting in rye and oatmeal. The gluten when wet, is a tough, elastic mass, of a yellowish brown color, and is obtained by dissolving out the starch and other constituents of the flour with cold water. The process is as follows:

The flour, having been made up into a soft dough, is placed on a fine sieve, over a vat of water, and is kneaded—in Italy with the feet—as long as the water which falls on it in a spray, runs through milky. The tenacious nature of the gluten, prevent its passing through. Starch is manufactured from the contents of the vat.

The long, hollow tubes are formed by pressing the gluten through a peculiar-shaped opening in a metallic plate; and this tubular form, so important to it in cooking, is indispensable to its drying, as gluten, when moist, rapidly tends to decomposition.

Counterfeit macaroni is made from flour, instead of from its gluten. It has, moreover, a starchy appearance; is more smooth and glossy than the genuine; is apt to be mouldy inside; is not as elastic; when broken, does not show the glossy fracture of the former, and in cooking becomes pasty, and does not preserve the tubular form. The genuine also—as the counterfeit does not—swells up to more than double its original thickness.

It would be a gain to our cookery if macaroni were in more common use among us.

A PAINTER'S apprentice fell off a scaffold with a pot of paint in each hand. He was taken up insensible, but as soon as he was restored to consciousness he murmured, "I went down with flying colors anyhow."

KURTH'S PATENT COCKLE SEPARATOR.

In order to make a good flour it is of course absolutely necessary to have all foreign seeds separated from the grain before it is ground. Some few years since Kurth's Cockle Separator was patented and introduced for this purpose, and has since been improved in many respects as experience showed to be necessary, and is now unquestionably the best machine in use for this purpose and is in practical use in all the best mills in this country and many in Europe. The patents on this well-known machine are the sole property of the Cockle Separator Manufacturing Company of Milwaukee, Wis. We present herewith a description with illustrations of this machine, which is now considered a necessary adjunct of every flour mill.

Fig. 1 shows an interior view of the cockle separator and the manner in which the cockle and other foreign seeds are taken from the grain.

The grain falls on to sieve "A," the large wheat passing over the tail, and thence by spout "B" "B" to hopper "C," while the small wheat and cockle fall through sieve "A" into spout "D," thence through spout "E" "E" "E," and fall into bottom of indented cylinder "F," the cockle fitting into the indentations, and thus, by the revolving of the cylinder, being carried up past the apron "G" "G," then being forced out of indentations by brush "H" "H," falling on apron "G" "G," and into cockle spout "I" "I" conducting from machine, while only the ends of the kernels of wheat being able to stick into the indentations, they consequently fall out before reaching apron "G" "G," slide back to the bottom, and at the same time are impelled by the motion and inclined position of the cylinder toward the hopper "C," where they mix with the large wheat from tail of sieve "A." The size of indentations in cylinder are varied according to the size of grain and impurities to be separated.

Fig. 2 shows the plain machine in general use. It separates perfectly cockle, wild peas, wild buckwheat and all similarly shaped seeds from wheat without waste. Four sizes of these machines are built, Nos. 0, 1, 2, 3, varying in capacity from 15 to 110 bushels per hour.

Fig. 3 represents Kurth's Patent Cockle Separator and Richardson's Dustless Out Separator combined. This machine has two sections, the first of which operates on the wheat as it enters the machine, and the second as it leaves it, thus removing all foreign matter rubbed off the berry by the scouring process of passing through the cylinder. Each section is independent of the other and is easily regulated.

The Cockle Separator Company are also manufacturing a separator especially for the use of oat meal mills, so as to free oats from all foreign substances. These machines should be in every mill, and those who have not yet introduced them should lose no time in writing to the company for their new illustrated circular giving full particulars, dimensions, capacity, prices, etc. Address Cockle Separator Manufacturing Company, Milwaukee, Wis., U. S. A.

EGYPTIAN CORN IN CALIFORNIA.

Experiments with Egyptian corn have proved signally successful in various parts of the San Joaquin valley, California, and we perceive that Mr. Jefferson of Healdsburg reports that he has just harvested eighty bushels to the acre from an Egyptian corn field. He plants sixteen to eighteen inches apart, not leaving over two grains in the hill. He gets three to six good heads which he cures on the ground before putting away or threshing. He planted in the middle of May. The yield of Egyptian corn is usually double that of Indian corn, while the meal is said to make delicious bread, which is generally preferred by those who have eaten it to that made from Indian corn meal. The white variety is preferred for table use. We

are inclined to believe that Egyptian corn will soon become a popular grain in San Joaquin valley.

OUR NEW YORK LETTER.

[Special Correspondence United States Miller.]

BUFFALO, N. Y., Feb. 18th, 1879.—While New York State has not as many flour milling establishments as her sister State Pennsylvania, her flour manufacturing interest is as large, if not larger, than that of the adjoining commonwealth. This fact, although not generally known, is nevertheless a decided and stubborn fact. That New York is a greater flour-producing center than the Keystone State is ac-

fine, large, and heavily producing flour mills, is considered "quite some pumpkins" in the districts where he is located. But, then, a miller is one of nature's noblemen wherever he is found, and however humble his position in the business.

The flour manufacturing establishments throughout the State, so far as have been discovered by an extended ramble among them, and in interviews with the millers themselves, by THE UNITED STATES MILLER correspondent, have been kept busily running right through the season. Many of the mills in the interior of the State, being situated upon shallow streams, have been compelled to sus-

New Yorkers manifest the same spirit and notable enterprise in seeking an export trade as they do in other movements that have made them famous and filled their coffers with wealth, they will soon supercede the more cautious, slow-moving, and less enterprising Pennsylvanians in those localities where the latter have already created a demand and built up a trade for their products.

But, then, dear UNITED STATES MILLER, every miller in the country has the very same opportunity to get the foreign trade that is now so eagerly sought after, and, therefore, the most liberal, and shrewdest and sharpest flour manufacturers of America can do something in that direction if they

put in a bid for it, either in the way of correspondence, or by dispatching agents to Europe and South America, and having the matter properly "talked up" and manipulated.

There is a fine chance for our Western millers to make fame and fortune in the export flour business, and the UNITED STATES MILLER correspondent would sincerely like to hear that some enterprising and influential Milwaukee or Wisconsin flour-producer or producers had started a scheme that would render either him or them celebrated in trans-Atlantic countries and enriched him and them also. I am sure that the Milwaukee or Wisconsin millers would be remarkably successful if they undertook anything of the kind. The field is still open, gentlemen, and it only remains for you to put in your bids to secure a portion

of the export trade at least. Well, I have gone a long distance on these sheets, from Buffalo, New York, to Milwaukee, Wisconsin, and, now, I will go back to where the start was made. The New York State Millers' Association, with its prominent officials, is in prime condition, and while much good work has been done for the benefit of the flour business and the milling fraternity, the association is destined to do much more in the interest and for the welfare of its members and the flour manufacturers of the State for whose guidance and benefit it was originated. The Secretary of the association, Mr. I. A. Hines, of Rochester, reports every thing in a pleasant and flour-ishing condition. Mr. Hines is a fine, genial and courteous gentleman in every respect, and very popular among the millers of New York. Success to Mr. Hines and the entire milling fraternity of New York, is the heartfelt wish of

THE DUSTY MILLER.

TO FIND THE HORSE-POWER OF ENGINES.—One-horse power is raising 33,000 pounds one foot high in one minute. Before the introduction of the steam engine, it was found by experiment that with the average of horses the best speed for work was at the rate of two and a half miles per hour, and at that rate of speed a horse could raise, perpendicularly, a weight of 150 pounds 220 feet high in one minute, which is equivalent to raising 33,000 pounds one foot high in one minute, and was taken by Watt as a standard for horse-power, and is universally received as such. To find the horse-power of an engine, multiply the area of the piston by the average pressure in pounds, less five pounds per square inch for friction; then

multiply that product by the number of feet the piston travels per minute, then divide by 33,000. This will give the horse-power of the engine. Another rule is as follows: multiply the area of the piston by the boiler pressure, and this product by the travel of the piston in feet per minute; divide this last product by 33,000, then deduct 13 per cent for friction and condensation.

Professor Leone Levi, of the University of London, says that the aggregate earnings of English workmen are \$1,500,000,000 annually, out of which they could easily save \$75,000,000, while in point of fact they save only \$20,000,000, the balance being wasted, mostly in drink.

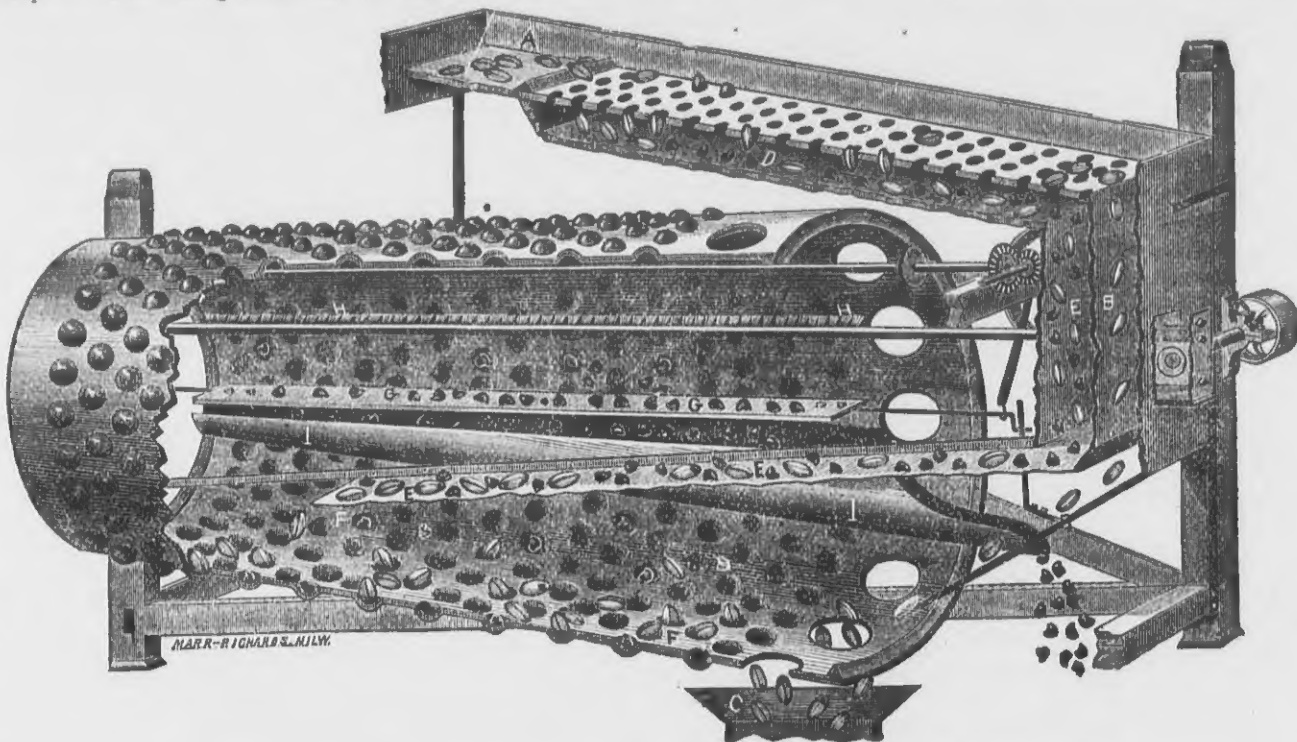


FIG. 1. COCKLE SEPARATOR—INTERIOR VIEW, SHOWING PROCESS OF SEPARATION.

counted for by the fact that while there are fewer mills within her borders than in Pennsylvania, the most approved methods and improvements in mill machinery necessary to increase the quantity and improve the quality of flour are appreciated and adopted by the wealthy, enterprising and liberal-minded mill-owners and millers.

The flour-making regions of this State are not connected, but spread out over a wide range of territory. This immediate section of the State, Syracuse, Rochester, Oswego, Albany, Troy and Utica, are large flour manufacturing places. In New York City there are also many vast flour mills where large quantities of the "staff of life" are produced weekly. Among the latter establishments

pend operations on account of the ice-bound condition of the streams, but now, since the thaws have set in, the mills have started, and are grinding away at the liveliest rate imaginable.

Outside of the wheat-flour manufacturing industry, New York is known as the headquarters of two of the largest corn starch and meal works in the world. The extensive establishment of Kingsford & Co., at Oswego, and that of Duryea & Co., at Glen Cove, Long Island, have gained the widest and highest reputation for the quality of the goods produced. The annual product of these works is actually immense. The city of Oswego is almost entirely devoted to the manufacture of this delicious and nutritious food, while the

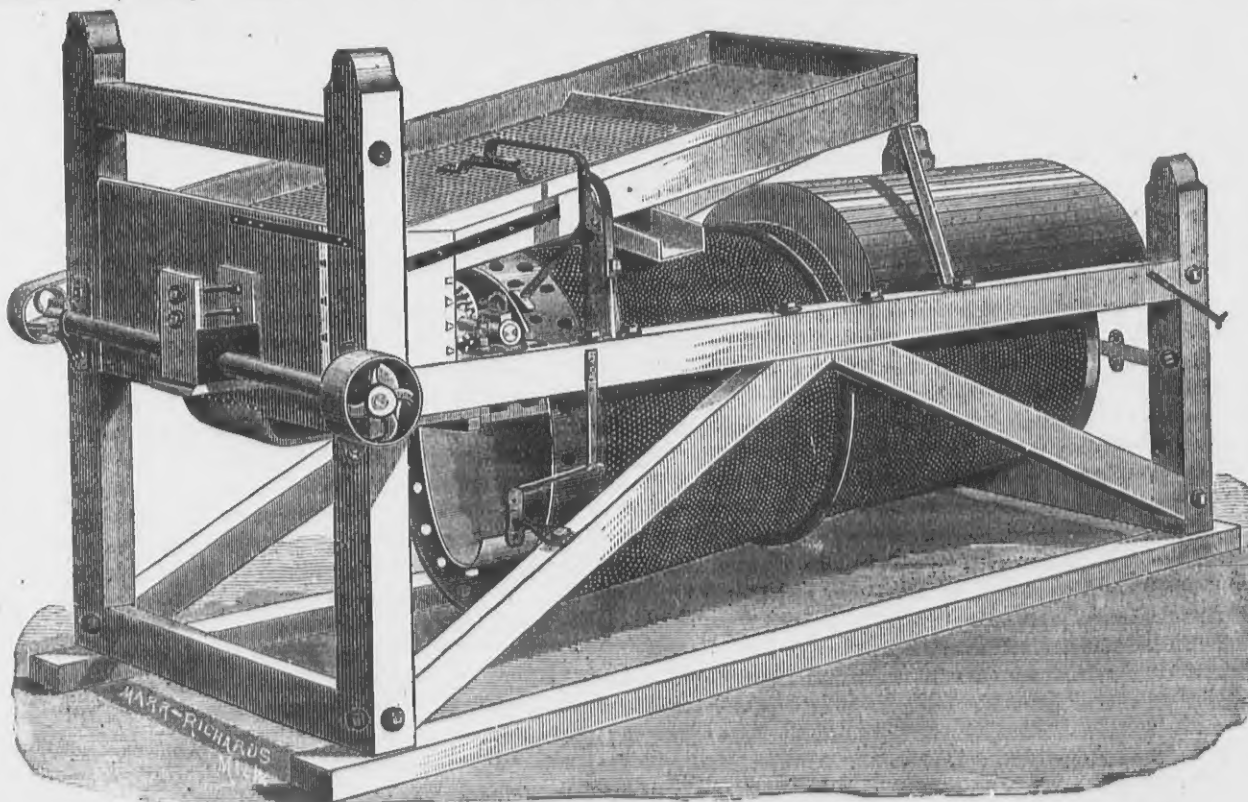


FIG. 2. COCKLE SEPARATOR—PLAIN MACHINE.

may be mentioned that of Geo. V. Hecker & Co., whose patented brand of "self-raising flour" is known to the trade in all parts of the country. There are many millions of capital represented by the merchant millers of New York, and the amount paid out weekly in wages to the army of mill operatives is a good, round sum.

While the flour manufacturers of the metropolis are a pushing, money-making class of business men, the "dusty millers" of the country districts are equally as thrifty, prosperous, and just as desirous of accumulating a goodly share of this world's goods. The millers of Buffalo, Rochester, Troy, Albany, Syracuse, and other places, represent the very best class of people, and the proprietor of a

number of hands employed in the factories is very large, and the amount of money disbursed as wages weekly is considerable. The flour factors of New York State are preparing, like their Pennsylvania brethren and competitors, to secure a European and South American trade, and arrangements are now in course of completion between several prominent manufacturers and flour operators in Europe and South America to undertake and manipulate a trade in the previously named countries. It is believed the millers of this commonwealth can secure about as much trade in the European and South American business centers as the Pennsylvania flour men. In fact, without any preference or prejudice one way or the other,—I am of the opinion that, if the

IMPORTANT COMMUNICATION.

To the Millers of the United States:

The undersigned, of the Executive Committee of the Millers' National Association, having charge of the defense of the suits brought by the American Middlings Purifier Company which are now being tried in St. Louis, avail themselves of this opportunity of conference with each other to unite in calling your attention to the fact that, while this defense is for the common protection of all, the necessary expense and individual time devoted to the defense is very unequally distributed, a very large majority of the millers of the country having failed to connect themselves with the State or National Associations, or otherwise contribute toward defraying the necessarily heavy expenses of preparing and conducting the defense of these suits, has left the liberal minority to bear the whole burden.

At the Toledo meeting of the Executive Committee, held November 21st, 1877, the authorized representatives of the several State Associations then organized assented to an assessment of \$15 per run on the numbers of burrs, such representatives thought could readily be brought into the local organizations; in many instances the apportionment was made on less than one-fourth of the total number supposed to be in use, and it was reasonable to expect that by energetic efforts of State officers their membership would be so large that considerably less than \$15 per run would make up the amount each State had agreed to contribute to the National Association, but instead of this several of the States failed to pay in any considerable percentage of the very moderate contributions promised, and it became necessary, at the Annual National Convention, held in 1878, at Indianapolis, to make another assessment of \$10 per run, making a total of \$25, the last assessment to be apportioned to the several States, on the basis of the Toledo agreement, producing sufficient funds, if fully paid, to pay all the expenses of these suits, and leave a balance for future contingencies. Maryland, Missouri, Minnesota, Wisconsin and New York have paid in full, and some of them in advance, besides which individual liability has been assumed on the belief that delinquents would ultimately pay.

Indiana and Illinois have paid to the extent of about three-fifths, and we feel assured, from conference and correspondence recently had with representatives of these States, that they will not long remain in arrears. Illinois has had to devote a considerable fund to local defense, the expense of which will equitably have to be allowed by the National Association to some extent. Ohio and Iowa will probably arrange to pay in full soon. From other States we have no sufficient assurances on which to base financial estimates.

Under these conditions it will be apparent to all interested that if the Executive Committee should abandon the hope of equal contributions from equal joint beneficiaries, they would require no excuse for relieving the paying members of unequal burdens by compromising on nominal terms with the owners of the Cochrane patents, and also of other recently re-issued patents, on the basis of full protection to all members who have, through their State Associations or direct covered into the National Treasury the full assessment of \$25 per run, leaving all who have not paid to take care of themselves. The committee would, however, prefer to fight and defeat unjust claims for wholesome effect on similar combinations which will otherwise harass the millers of the country, from which only the thorough and equitable organization proposed will afford mutual protection, and will delay this righteous means of getting even with the delinquents, believing that their failure to share the expenses so far arises from inattention rather than indisposition.

At the next annual convention—time and place not yet appointed, but probably to be held in Chicago early next May, if not sooner—the Executive Committee will propose and urge:

First—That the Millers' National Association be re-organized on a strictly legal basis for the defense and protection of its members.

Second—That only such members as have by that time fully paid, through their State organization, or direct from States where no organization exists, to the National Treasury the assessment of \$25 per run, shall participate in such proposed re-organization.

Third—That new members shall be eligible only on payment of the same assessment per run which may have been paid by old members up to the date of the proposed new members' admission, putting all on equal terms.

Fourth—That representation shall corre-

spond with payments, one vote for each full paid run, or its equivalent—as in stock companies.

Fifth—That failure or refusal to pay or secure assessment equitably and legally made, shall cause a forfeiture of interest in the association.

Sixth—That suits now being prosecuted against members of the National Association, notably the Denchfield and the Griffin suits, shall be defended by the National Association, as also all other patent suits that the Executive Committee may decide are defensible.

Seventh—That all patents considered by the Executive Committee to be valid and useful should be compromised for the benefit of all full-paid members of the National Association who may choose to avail themselves of the terms of such compromise, that the fullest possible encouragement should be accorded honest inventors, whose machinery will improve our manufacture, by arranging for moderate terms, alike bearable to users, and remunerative to inventors; but that all fraudulent claims should be fought to the bitter end regardless of expense.

Eighth—That they deem it expedient to recommend the appointment of one person (centrally located) to hold both offices of Secretary and Treasurer, and while pleased with the

Secretary of the National Association full lists of all members who have paid or secured the full assessment, with the numbers of burrs used by each, and from time to time additional lists weekly of those who pay and of new members who join, with also a remittance to the Treasurer of the National Association, including previous payments, to equal the \$25 per run due thereon. Members in States not organized, or millers in such States who desire to become members, will please remit direct to the National Secretary or Treasurer, and if such States subsequently effect organizations then such payments will equitably be credited against the proportion due from that State.

While the Committee have too much respect for the high tribunal before which the suits now pending are being ably and impartially tried to express any opinion as to the result which may be reached and announced before many weeks, we have no hesitation in the unqualified assertion that our attorneys and experts one and all have done and are doing their whole duty faithfully and intelligently, and whether they win or lose the cases in hand, we are certain that they will have done all that could be expected. We who are familiar with the immense labor and thought required in preparing the cases for trial, the thousands of pages of printed evidence, doz-

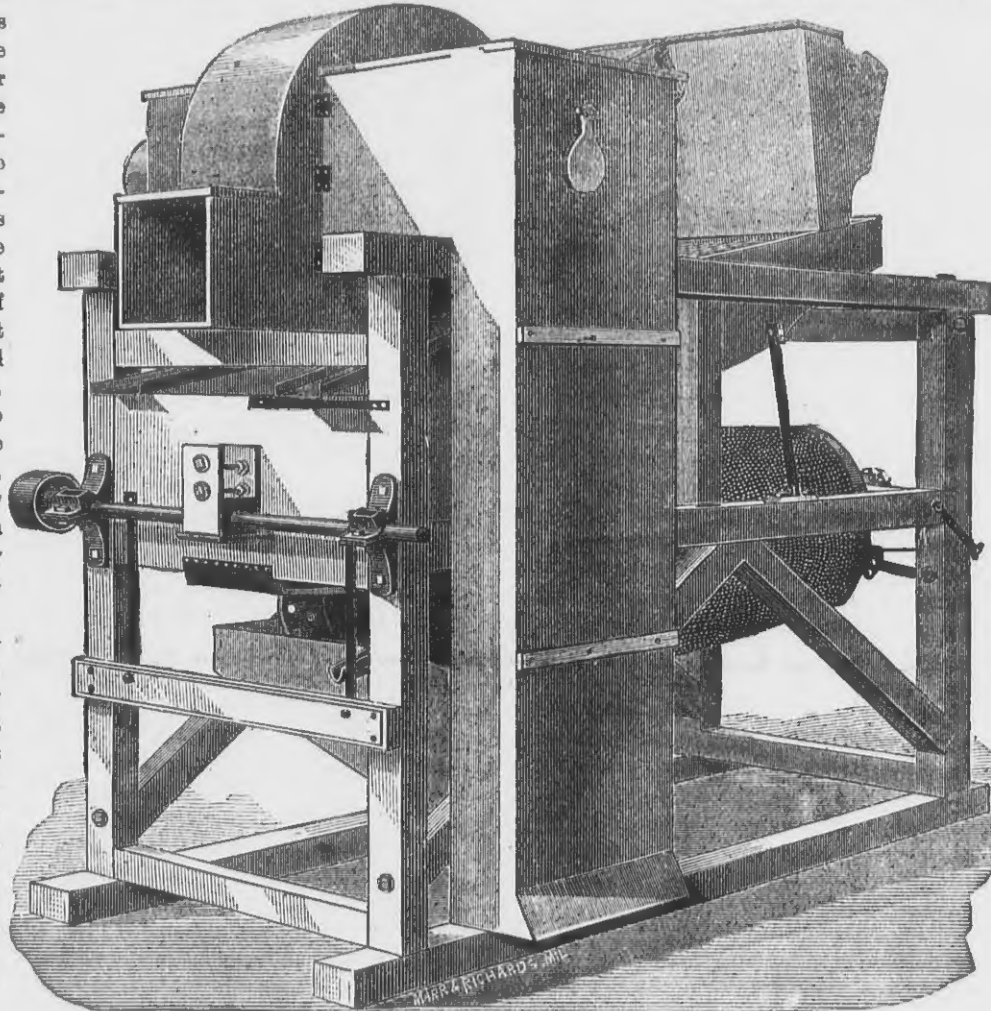


FIG. 3. COCKLE SEPARATOR AND RICHARDSON'S DUSTLESS OAT SEPARATOR COMBINED—(TWO SUCTIONS).

services of the gentlemen who have held these offices in the past, they believe it necessary to the success of the organization to have some person who can devote a greater amount of his time to the objects of the association, and who can attend the meetings of the Executive Committee and of the different State Associations from time to time, and push the membership of the association up to a maximum.

Ninth—They will also insist on the appointment of a competent patent attorney, to whom all claims against millers shall be submitted, and whose judgment, and the decision of the new Executive Committee shall be submitted to each member of the association, and it shall be required of each member to furnish within thirty days to the Secretary any information he may be possessed of in regard to the matter under consideration, and should the Executive Committee then decide that it should be for the interest of the association to compromise or fight the claim, such decision shall be final and binding on the members of the association.

Tenth—Officers of State Associations are urged to hold early meetings for re-organization on a strictly legal basis, which will bind members to equal legal assessments, and with sufficient authority to participate in the proposed re-organization of the National Association. Prominent millers in States which have not yet organized should also be active in effecting an organization. The Executive Committee will have a proper legal form prepared, copies of which will be furnished on application to any of the undersigned, who will also take pleasure in furnishing any other aid in their power to that end.

Eleventh—Secretaries of the several State Associations are requested to furnish to the

ens of working models, resulting from immense research, ransacking foreign libraries, preparation and duplication of drawings of intricate machinery, and the thousand and one details which have had to be worked out, and the complications arising from the Supreme Court decision which were successfully cleared off preparatory to the trial, now progressing, feel a pardonable pride in the fact that all the expenses so far incurred is less than one-fourth of the confiscatory demand of three hundred thousand dollars made against only one mill soon after the Supreme Court decision, on which the ring estimated its claim against the millers of the country at the modest sum of thirty-six millions!

However the case may be decided, the defense made will have saved the millers of the country millions, for under the measure of damages recently fixed in similar cases, they can only be insignificant in comparison with former pretensions which have been lowered at both ends, fewer ciphers at the "right" and lower numerals at the "left." In any case, we advise millers not to get frightened, make no settlements or compromises—"millions for defense, not one cent for tribute." Rally to your State and National organizations; do not wait for somebody to come and talk you into doing your duty; see it and do it promptly for yourselves. We rely on a free, full and hearty support from every miller in the land who has not already been scared into bleeding to the Ring.

J. A. CHRISTIAN,
S. H. SEAMANS,
J. A. HINDS,
ALEX. H. SMITH,
Committee.
GEO. BAIN, President.

St. Louis, Feb. 17th, 1879.

THE ICE BRIDGE AT NIAGARA.—Niagara river below the falls is spanned by a bridge of ice one mile long and 60 feet wide. The river has been spanned in this way before, but seldom, if ever, so early as now. The other day the ice "jammed" beneath the upper suspension bridge. Says the Buffalo Courier: A vast quantity of water had accumulated behind the ice and made a desperate effort to get free. The enormous body of snow and ice was raised up by the water and tossed about in all directions. Large blocks, weighing hundreds of tons were lifted into the air. Boulders were torn from the shore and swept into the stream, and a solitary fir tree, which ordinarily stands three feet above high water, was carried away. The ponderous strength of the enraged waters was so apparent that it seemed as if they would rend the great gorge in twain, and in that way escape from their imprisonment. As they could not break the mile-wide dam in two, they lifted it bodily into the air and rushed away beneath it, leaving a span of ice above and behind them. The formation of the ice in this bridge is not the same on both sides of the river. On the American side it is chiefly composed of snow formed into rounded boulder shapes, and looks like white coral. As one approaches the center of the river the ice fragments become larger, and near the Canadian shore huge cakes of water-ice are formed into a solid mass. In some places there are crevices 25 or 30 feet in depth, but water is not seen through them.

SOUNDED LIKE A JEWELLERY STORE.—It was a weather-beaten sailor we overheard the other day kindly giving a few reminiscences of travel to some lady friends he was treating to corned beef and cabbage. "Talking about lions," he went on to say, "they are the intelligentest animal what is. A curious thing happened once when we were on the east coast last cruise. One of our officers went out hunting deer, and the next morning his body was found bit clean in two, but with his watch missing. Nobody understood it. Next day the quartermaster's body was found in the same condition, with his watch gone. Seemed as though a lion and pickpocket were kinder going sneaks, as it were, only the lion didn't eat nothing. Next day two middies disappeared—same result. None of the sailors were hurt—had no watches, you see. Of course the old crew turned out for a grand hunt, and at last we killed a lion sixteen feet long. In his stomach we found all the watches, still running. Cold fact, I assure you. The ship's surgeon, who cut the beast open, said he wasn't in good health—had a torpid liver. So we seed at once that the animal had killed all the officers just to swallow their watches—sorter like pills, you know. The lion must 'a thought the wheels and things would kinder tickle him up inside. When we shot him he was lying with his eyes shut and mouth open, listening to the works going inside of him. Sounded like a whole jewellery store. Fact, ma'am. Take some more cabbage."

GREAT SHRINKAGE IN VALUES.—The shrinkage of manufacturing property in New England is unprecedented. A paper mill built and run by the Valley Falls Paper Company at New Boston, N. H., was sold at auction a few days since under foreclosure for \$5,000; it originally cost \$50,000. It was built in 1867, is well appointed in all respects and has a fair water-power. The Littleton, N. H., woolen mill, which has been idle for three or four years, was recently sold for \$7,000 cash. The purchase includes the mill, machinery, water-privileges, boarding-house, two acres of land at mill, and five acres of woodland about two miles from village. The property was bought in 1862 for \$92,000, and used for the manufacture of woolen blankets until 1870. Nor is the shrinkage confined to New England. Two furnaces and other buildings of the Mingo Iron Works at Steubenville, Ohio, were bought in by the first mortgage bondholders for \$67,000; the second mortgage was \$75,000; other debt, \$185,000. The buildings of the New York Steam Sugar refinery, covering 24,000 square feet of land in fee, and four leasehold lots, each 23 x 70 feet, on South, Water, Cherry and Montgomery streets, Brooklyn, together with machinery, were sold by auction for \$42,250. This was the only bid made. The property originally cost \$202,000; the improvements afterwards made bring it up to \$500,000.

The steam boiler exploded in Isenmayers flour mill at Little Rock, Ark., Feb. 7th, killing the engineer, Horace Burns, and entirely demolishing the engine house and machinery therein.

THE POWER OF NIAGARA.

Dr. Siemens, some months ago, in an address which he then gave, referred to the immense quantity of power which flowed ready-made over the Falls of Niagara. In his Glasgow address he again referred to the subject, in order to show how this gigantic source of power might be utilized to produce action at a distance. "When," he says, "little more than a twelvemonth ago I visited the Falls of Niagara, I was particularly struck with the extraordinary amount of force which is lost as far as the useful purposes of man are concerned. 100,000,000 tons of water fall there every hour from a vertical height of 150 feet, which represent an aggregate of 16,800,000 horse-power, producing as the effect no other results than to raise the temperature of the water at the foot of the fall

150 1 deg.
—Fahr.
772 5 deg.

In order to produce the power of 16,800,000 horses, or, in other words, to pump back the water from below to above the fall, would require an annual expenditure of not less than 266,000,000 tons of coal, calculated at an average consumption of four pounds of coal per horse-power per hour, which amount is equivalent to the total coal consumption of the world. In stating these facts in my inaugural address on assuming the Presidency of the Iron and Steel Institute, I ventured to express the opinion that, in order to utilize natural forces of this description at distant towns and centers of industry, the electric conductor might be resorted to. This view was at that time unsupported by experimental data such as I have been able since then to collect." Dr. Siemens then shows what had been done in conveying the electric light to a distance; and he states that "if mechanical force is required to be distributed, the arrangements are in every respect similar to those for the distribution of electric light; and it has been proved experimentally that the amount of power recovered at the distant station is nearly equal to half the power employed at the central station." Even as regards the consumption of coal, were that article used, Dr. Siemens shows that the magneto-electric machine is cheaper than the gas or steam engine. But he rightly says: "It would not be necessary to seek on the other side of the Atlantic for an application of this mode of transmitting the natural force of falling water, as there is perhaps no country where this force abounds to a greater extent than on the west coast of Scotland, with its elevated lands and heavy rain-falls. You have already conducted the water of one of your lochs to Glasgow by means of a gigantic tube; and how much easier would it be to pass the water, in its descent from elevated lands through turbines, and to transmit the vast amount of force that might thus be collected, by means of stout metallic conductors, to towns and villages for the supply of light and mechanical power."

THE NEW GRIST SYSTEM.

Of late years the practice of grinding grists for individuals has been losing favor, both with millers and with individuals. The customer goes to the mill in the morning with no assurance that he can return the same day. He takes an early start, perhaps leaves business of importance at home, and after wasting the entire day loitering about for his "turn" returns home at night, hungry, cold, tired and cold, and often without his grist, necessitating a return trip the next day. Or if he succeeds in making the trip in one day, he returns with a quality of flour on which he has to take his own chances. He has part of his own grist and part of the grist of the man who was just ahead of him. If it is good flour, all well and good; if it is poor it is supposed to be from his own wheat and he has no opportunity to complain.

We are led to these remarks from a conversation with Mr. H. Brinck, of this place, who claims that there is neither reason nor justice in the old system. He claims that the exchange system, now in operation in his mill and in all the city mills, is the only proper and satisfactory one to all parties. He claims that he gives better, more uniform and a larger quantity of flour, in one year, than any farmer can get in the same time from a toll mill. A man takes his grist to the mill, it is weighed and he receives in exchange an article of flour which is warranted to him the same as though he had purchased it for cash at the stores. The transaction occupies about five minutes, often less, and he drives home in a far better humor with himself, the miller and the world generally than if he had passed the day in idly waiting for his grist. We suppose there are

arguments on both sides of this question but until we hear from the other side we are forced to the conclusion that there is economy in time, money and quality of flour in the exchange system which is now coming into such general use.—*West Point, Iowa, Appeal.*

ENORMOUS CROPS IN 1878.

The December report of the Department of Agriculture shows that the corn crop for 1878 is some 30,000,000 bushels larger than that of 1877. The oat crop is somewhat in excess of that of 1877, making it the largest ever raised in this country. The average yield per acre is, however, less than in 1877, and the quality in most of the States is inferior. There is no material change in the barley crop from 1877, except that California increased her acreage from 450,000 to 650,000 acres, and almost doubled her yield per acre. The total product for the year will be, in round numbers, 42,000,000 bushels against 34,500,000 bushels in 1877. The rye crop is about one-sixth larger than in 1877, but the quality of the crop is inferior in the New England (except Connecticut) and Southern States, while in the States of the West, Northwest, and Pacific slope it is superior, except in Illinois and Nebraska. The potato crop shows a large decline as compared with 1877, though the average was about the same, the difference being less than 1 per cent. The average yield of the whole country will be 69 bushels per acre against 94 bushels in 1877, making a total product in round numbers of 124,000,000 bushels for 1878, against 170,000,000 in 1877. The hay crop is 20 per cent greater than last year. Sorghum is receiving increased attention, especially in the trans-Mississippi States and Territories. In Stearns county, Minnesota, a variety called amber cane is reported as yielding as high as 300 gallons of syrup per acre. Delaware county, Iowa, manufactured 100,000 gallons of syrup during the year, and found a home demand for the whole. The tobacco crop is larger and exceptionally good.

DEATH OF A CELEBRATED FARMER.—Mr. W. L. Sullivan, of Burr Oaks, Ford county, Ill., for many years known as the "Farm King" of the West, died on the steamer James Guthrie, en route for Louisville, Ky. His illness came on a mile below Owensboro, Ky., and he died before the boat reached the wharf. The body was taken to Henderson, Ky., and arrangements made to convey it to the home near Burr Oaks. Mr. Sullivan's great farm of 40,000 acres, comprising nearly the entirety of Ford county, has been one of the wonders of the agricultural world. For many years its master operated the mammoth farm on the most expensive scale, its 10,000-acre corn fields being the pride of their owner and the surprise of sight-seers. There were headquarters on the place from which all orders were issued, and laborers sent out with teams, tools and dwellings—drawn on wheels by horses and oxen—to put in grain or attend to harvesting, the time occupied in the work sometimes detaining the detachments of laborers for weeks away from the central depot of supplies. But the venture proved a failure in the end, and only a year or two since the great farmer went into the bankruptcy, his farm passed into the control of money-lenders, and was cut up into small farms and offered for sale in the market. It is not known that Mr. Sullivan saved intact any of his fortune, and the probability is that he died a poor man, and in his death proved that it is not possible for one person to successfully manage 40,000 acres of land in one batch. The deceased was an aged man, but had enjoyed excellent health all his life, even to his last day on earth. He was a man of native sagacity, and one with the qualifications and inclinations to grapple with great projects. His funeral will do doubt be the most largely attended of any ever known in Central Illinois.

LONGEST TUNNEL IN THE WORLD.—The Gothard tunnel is now the longest tunnel in the world, the length, bored from both sides, reaching a total of 13,481 yards—twenty-three yards longer than the Mont Cenis. Very nearly 3,000 yards still remain to be excavated, and if the work goes on as rapidly this year as it went on last the navies from Goschen and those from Airolo may expect about this time twelvemonth to shake hands in the heart of the mountain. This, however, is far from being a certainty, for according to the calculations of the geologists, the workmen will find directly under the Kastelhorn a thick mass of serpentine and schist, which may prove a considerable hindrance. Most of the laborers employed in the galleries are Italians. They work night and day in the shafts of eight

hours each, and their work is described as being terribly severe. The heat is so great that they can wear no clothes whatever. They return to the mouth of the tunnel steaming with perspiration, their faces are yellow and ghastly, they cannot bear the light of the sun, they walk with bent shoulders, and stagger as if carrying burdens too heavy for their strength. They are nevertheless said to be cheerful and even merry. They support their hard lot without repining, and save money. It is satisfactory to know that the contractors by whom the men are employed treat them with every consideration. A surgeon is always on the spot, accidents being frequent, and ample hospital accommodation is provided for the ailing and the hurt.

COATING BOILERS.—Mr. Franz Beutgenback gives the following recipe for the preparation of a coating for the inside surface of boilers to prevent the formation of scale: Gradually dissolve five pounds of a mixture of 25 parts of colophonium, two and one-half parts of graphite, and two and one-half parts of lamp black in 40 pounds of boiling gas tar, adding about one pound of tallow. The solution is diluted with about 50 per cent of the petroleum and applied in a warm state. It has a pungent smell and should be put on rapidly, the precaution of using closed lanterns being necessary. Its effect is to cause the scale to come off in large flakes when picked.

MAKING PENCIL MARKS INDELIBLE.—Paper marks are made indelible, says the *Papier Zeitung*, on paper prepared as follows: Any ordinary drawing paper is slightly warmed and then rapidly and carefully laid on the surface of a bath, consisting of a warmed solution of bleached colophonium in alcohol until the entire surface is moistened. It is then dried in a current of hot air. The surface of the paper becomes smooth, but readily takes the impression of a lead pencil. In order to make the lead pencil marks indelible, the paper is warmed for a short time on a stove. This method may prove valuable for the preservation of working drawings when a lack of time will not permit the draftsman to finish them in ink.

THE BANK OF ENGLAND.—The Bank of England will be 185 years old on the 27th of the coming July, having received its charter of incorporation at that date, and having been projected by William Paterson, a Scotchman. Constituted as a joint stock company, with a capital of £1,200,000, the whole sum was lent at interest to the Government of William and Mary, then much embarrassed. At the outset it was a servant of the State and has ever since continued such more or less. The charter, granted at first for eleven years, has been from time to time renewed, the last renewal, subject to modification or revocation, having been in 1844. For a while the business was done in one room; now the bank occupies, as everybody knows, a large building in Threadneedle street and employs some 800 men. Nothing less than a £5 note is ever issued, and no note issued a second time. The average amount of notes in circulation is £25,000,000.

HOW TO SMOKE A PIPE.—A correspondent of the *New York Sun* gives the subjoined information: "To those who are attached to the pipe, it may be a matter of interest to know how their last puff or draft of smoke may be as fresh as the first. It is well-known that smoking in the usual manner the last portion of the tobacco becomes damp by presence of oil or nicotine drawn from the heated tobacco above, which causes a sickening and nauseating effect, bitter to the taste, unpleasant and unhealthy, as compared to the first half of a well-filled pipe. The following I have found to be effectual in giving me a good, fresh smoke from first to last: Place a small quantity of tobacco in the bottom of the bowl, light it, and when well afire, fill the pipe and before each draft give a light puff outward through the stem, which causes the tobacco to burn upward, all below being consumed. This is a sensible way of smoking the time-honored pipe."

THE GREAT FAMINE IN BRAZIL.—Mr. Herbert H. Smith, who is now in Brazil, collecting material for a series of papers on that interesting empire to appear in *Scribner's Monthly*, writes as follows: "People in the United States know little about this great famine that is raging in the northeastern part of Brazil; I myself had no idea of its importance until very lately. It is enough to state that it affects at least one-fourth of the whole population of the empire; that hundreds are dying of starvation, and thousands of disease in-

cident to exposure and insufficient food. In the city of Ceara, which will be my principal point of study, the normal population of 30,000 has been swelled to 80,000 by fugitives from the drouth-smitten interior country; and among this 80,000, the death rate has reached the enormous figure of 300 per day. These drouths are periodical, occurring once in twenty or thirty years. It seems to me therefore, that a study on the spot will be of very great importance; it is entirely another side of Brazil from that which I have before seen and written of."

A CLOTHES has excited public curiosity by having a large apple painted on his sign. When asked for an explanation he replied: "If it hadn't been for an apple where would the ready-made clothing stores be to-day?"

TO MAKE IRON TAKE A BRIGHT POLISH-LIKE STEEL.—Pulverize and dissolve the following articles in one quart hot water: blue vitriol, one oz.; borax, one oz.; prussiate of potash, one oz.; charcoal, one oz.; salt, one-half pint; then add one gallon linseed oil, mix well, bring your iron or steel to the proper heat and cool in the solution. It is said the manufacturers of the Judson governor paid \$100 for this recipe, the object being to case-harden iron so that it would take a bright polish like steel.

SAYS the Dodge City, Kan., *Times*, of January 11th: "Mr. May, one of the owners of the flouring mill at Decatur, Ill., was in Dodge City Monday, and purchased a mill site. He returned East the same evening. The shipment of the mill will take place immediately. Sixteen cars will be required to furnish transportation for this immense structure. We do not consider this project inopportune. There will be more than a sufficient quantity of wheat raised the coming season to keep a mill running. In Ford county alone about 17,000 acres have been sown in wheat."

MR. GEORGE JENNISON, a millwright, has adopted a very simple and readily applied apparatus which can be used without the usual level boards and without regard to obstructions. Mr. Jennison takes an ordinary 3 or 4 inch gum tube, say from 16 to 20 feet long, and to each end secures a stout glass tube 10 or 12 inches long. The gum tube is then filled with water to within about four inches of each end of the glass tubes. A cork is placed in each end and the apparatus is complete. To use it, hold each glass vertically at the bearings, and withdraw the corks. The water will soon find its level and show how the bearings stand with regard to the level line.—*St. Louis Miller.*

In perusing our statement of the general business outlook at the South, our readers will notice a difference in the tone of feeling in the different States. The most complaining is Virginia, the most hopeful and prosperous is Georgia; the others resemble Georgia rather than Virginia. The cause of this difference is easy to find. Virginia is still running in her old ruts, the raising of tobacco being her chief industry and the partition of land remaining very much as before the war. But the great plantation States could not go on by their old methods. It has been found expedient to diversify their crops. They raise their own wheat, corn, vegetables and pork, and are not dependent solely on cotton, as the owners of the great plantations used to be when they engaged their expected cotton crop in the beginning of the year for money to purchase their supplies.—*New England Grocer.*

INTERNATIONAL EXHIBITION OF THE UNION OF GERMAN MILLERS IN BERLIN, 1879.—It has been decided that on the occasion of the next general meeting of the above society, to be held in the building of the Society of Brewers, "Tivoli," there shall be an international exhibition of machines, confectionery, baking, and cutting machines, which is to be opened on the 22d of June, and to remain open until the end of July. The space at the disposal of the society consists of about 8,000 square metres, so that there will be ample room for the display of a great many objects. Many applications for space have already been received, and some even from Holland, Switzerland, etc., etc. The latest time at which applications can be entertained is the 1st of March, 1879, and they must be addressed to "The International Exhibition of German Millers, Jos. I. Van den Wyngaert, Potsdamerstrasse, 95, Berlin, W.," where forms of application and every other information may be had.

Subscribe for the U. S. MILLER; \$1 per year.

GRAIN.

Peculiarities in its Normal and Manufactured State.

An Investigation Under the Microscope—Showing the Adulterations and Natural Evils to which It has been Subjected.

A COMPLETE INVESTIGATION OF THE SUBJECT BY ONE OF THE LEADING CHEMISTS OF EUROPE.

Flour in General—Wheat Flour—Rye Flour—Barley Meal—Oat Meal—Indian Corn—Rice Meal.

[Translated from the German of Dr. Herman Klenke expressly for the UNITED STATES MILLER.—cuts reproduced by our special engraver from the original.]

[Continued from last number.]

Rust, *Puccinia graminis*, which covers especially the stalks and leaves of grain, is only communicated to the berry in threshing, and it is known by its translucent, cylindrical utricle of sporules, which have rather long petioles. It injures the corn greatly by its influence on the life of the grain-plant, causing the grains to shrink. In Fig. 4 we give a picture of this fungus in the different stages of its development, magnified 500 times. Fig. 5 represents wheat-flour which has been damaged by the sporules of rust, magnified 420 times. Poor, muggish flour which has been wet, is not unfrequently infected by mold, *Penicillium glaucum*, *P. sitophilum*, and *P. roseum*, and assumes (different as to the kinds of the fungus) a greenish, brownish or reddish hue in some of its parts. Fig. 6 represents a picture of the mold (*Penicillium glaucum*) in the highest stage of its development and sporule formation. Flour, especially wheat-flour, can further be of an inferior quality by having an admixture of the seed of common weeds, es-

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Mould (*Penicillium glaucum*) in the highest stage of development and formation.

ture. Even the meal of the so-called perennial dandelion or madwort (*Lolium temulentum*) has been found in flour. Such flour can have the most injurious effects upon the health. The way to discover this deception is by dissolving the suspicious flour in alcohol of 35 deg. (specific weight 0.847), for the stronger the alcohol is, the less will it become colored; the purer the flour is, the clearer will the alcohol remain, and will then at the utmost become straw-colored, namely, from the husky particles of the corn, which the bolting process

animals, which are especially apt to be found in old flour. If the presence of such is suspected, it is only necessary to resort to the microscope. As in sugar, so in flour, there lives a mite, which has been called the meal-mite *Acarus farinae*, and which is often to be found in enormous numbers in old flour. It is necessary though to mention that this mite is to be found much more rarely in wheat flour and rye flour than in the flour of the legumes; and when the flour of grain has been fraudulently mixed with the latter, the mite is also transferred with it.

Fig. 8 is a picture of the meal-mite magnified 220 times. The feathered mite *Acarus plumiger* is also to be found in flour. It is wholly covered with feathery bristles (fig. 9). Besides these the caterpillar of the meal-moth, *Asopra farinalis*, exists in flour, especially in May and September, and by its numbers renders the flour unwholesome; it is transformed to a pilser with dark-brown front wings, which have a lighter-colored wide middle spot bound on each side by a white line, and ash-colored hind-wings. An animal is further found in flour resembling the infusoria, which has been called *Vibrio tritici*; they live in the seed, and hinder the formation of starch, give the kernel a pepper-like shape and find their way into the flour. According to Prof. Henslow's observations, this *Vibrio* is said to occur frequently in England and be known to millers by the mere appearance of the corn and flour. In Fig. 10 it is represented magnified 100 times. In general all impure and damaged

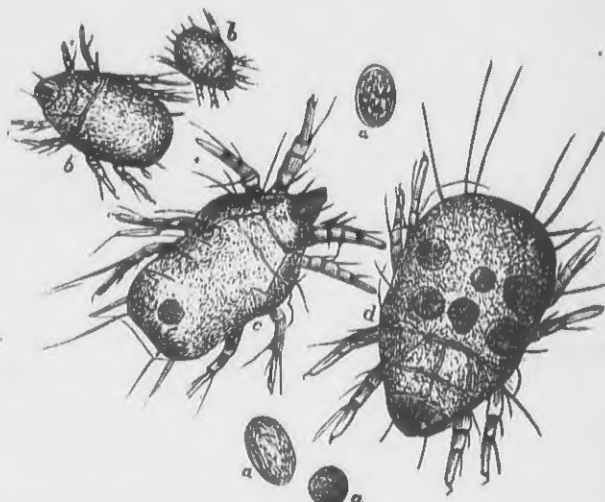


Fig. 8. Meal-mite (*Acarus farinae*). *a a*, eggs; *b b*, young mites; *c*, male mite; *d*, female mite. Magnified 220 times.

verbally or in writing, or by any fraudulent means, shall be liable to pay any damages sustained in consequence of any such registry or entry, to the person injured thereby, to be recovered in an action on the case."

Now, while it can not be doubted that the sale in Eastern markets of flour covered by a lying brand is a damage to St. Louis millers, individually and collectively, it would be an impossibility to form a reliable approximate even of the amount in dollars and cents.

The remedy is a simple one, and consists solely in making it a penal offense to brand a barrel of flour with a locality other than the actual point of manufacture or to alter or

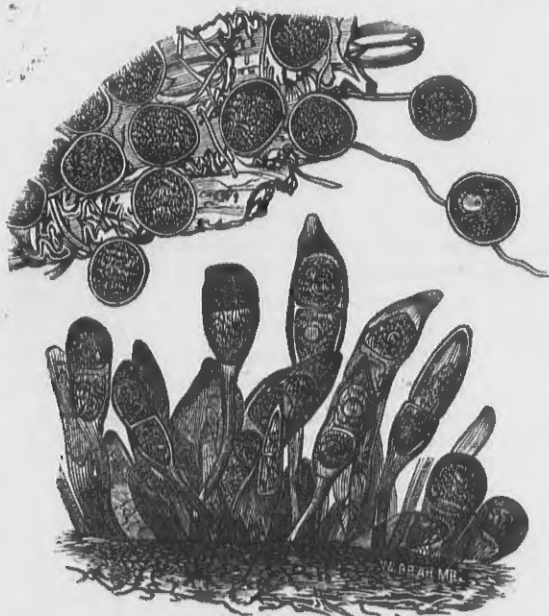


Fig. 5. Wheat flour damaged by sporules of rust, magnified 420 times. *a*, starch parts; *b*, sporules of rust.

pecially of the seed of black wheat or cow wheat (*Melampyrum arvense*) the contents of which are not noxious to be sure, but when mixed with the wheat-flour, which occurs quite frequently from carelessness in sifting, and is often too purposely done, it injures it, makes it less valuable, and imparts to the bread a bluish color and bitter taste.

An admixture of this kind may be discovered by kneading about 15 g. of such suspicious-looking flour with a sufficient quantity of diluted acetic acid ($\frac{1}{2}$ acid to $\frac{3}{4}$ water), thereby forming a very soft dough, which is then put into a silver spoon. This is held over the flame of a spirit lamp, and the mass is gradually heated to such a degree that the water and acid evaporate entirely, and the small portion

has not separated; at the same time it dissolves a peculiar resin which is contained in the husks, and its taste is thereby rendered sweetish, but by no means disagreeable. If the alcohol is allowed to evaporate (on a porcelain plate), a resinous, yellowish green substance will remain, which has the same qualities but now even more discernible as the alcoholic solution. It is also of importance to find out by the aid of the microscope, the presence of the seed of the perennial dandelion (*Lolium*) which has been ground into the flour. It is therefore necessary to be familiar with the microscopic structure of this seed.

Fig. 7 represents a length and cross incision of the seed; *A* the length, *B* the cross incision, magnified 200 times. The structure of its husk is very different from that of the kernels of grain. The husk is composed of three layers of membranes; the external layer *a* is only formed by a simple cellular substance, and therein differs from the arrangement of the cells in a grain of oats, while the longitudinal axis resembles somewhat the structure of a grain of rice, but still differs widely from it in other particularities of its form. The cells of the second layer *b*, consisting of two sections, differ from the seed of all cereals with the exception of that of rice. The cells of the third layer *c* form a single row, and resemble that of the grains of wheat. In *C* the starch particles of dandelion (*Lolium*) are represented magnified 500 times. Flour may not alone be mixed with and damaged by the seeds of fungi and weeds, but may also contain living

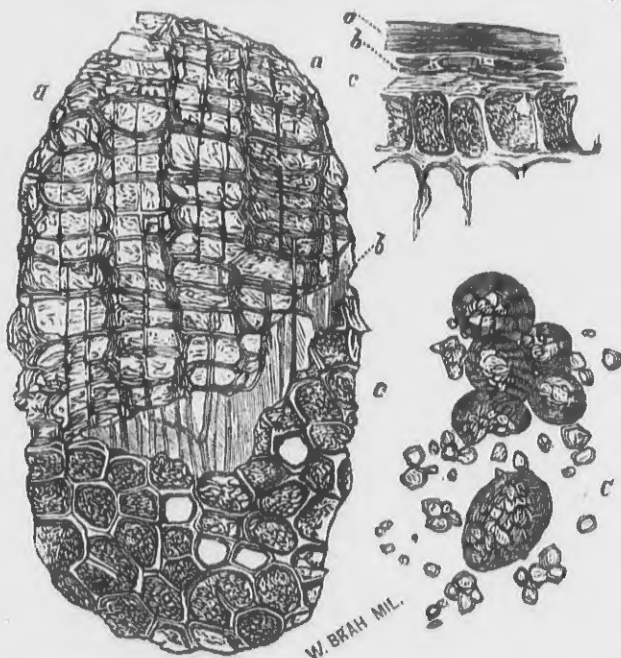


Fig. 7. Structure of the covering of a grain of dandelion (*Lolium*), magnified 200 times.

flour has a peculiar odor and appearance which distinguish it from the good; one may definitely judge it to be of a suspicious quality, when it forms hard and sometimes large lumps, has a musty odor, a disagreeable, acrid, bitter, sweetish or bad taste, and leaves a feeling of acridness in the throat. If it is even in a state of putrid fermentation and of a dull, white dim or reddish color, it is totally unfit for use.

[To be continued.]

DISHONEST TRADE MARKS.

Whenever Congress may in its wisdom design to make improvements in our existing laws, we would respectfully direct its attention to the necessity and common justice of a law which shall protect Western manufacturers of flour against the swindling devices of their knavish brethren whose product does not bear the high reputation held by St. Louis millers. It is well known that because of the fine quality of the wheat grown in this section, and the superior method of milling in vogue here, St. Louis flour everywhere commands the highest prices paid for any winter wheat product. This reputation is a valuable property to St. Louis millers, and anything in the form of dishonesty which tends to rob them of the natural result of their labor, whether under the protection of law or because of the lack of law, is a wrong which the law-makers ought to redress at the earliest opportunity.

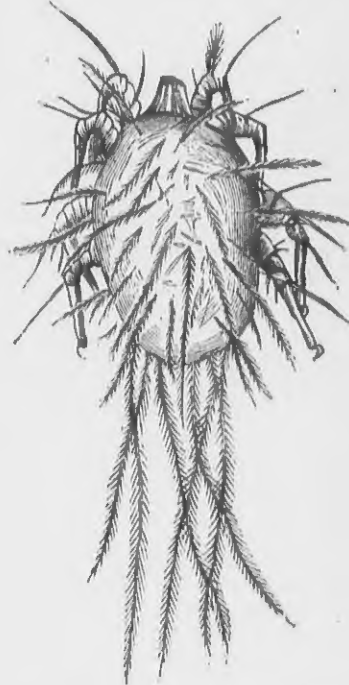


Fig. 9. The feathered meal-mite (*Acarus plumiger*), magnified 100 times.

efface the original brand. St. Louis millers ask no more than a fair chance, but in simple justice they have a right to and should demand that the law protect them from the dishonesty of others.—*St. Louis Post and Dispatch*.

Angus Smith will commence the erection of the new elevator next spring. The brick work of the old Sweet elevator will be removed and the frame and its bins rolled over to the west side of South Water street, where the wood work will be re-bricked and fitted up for further service.—*Milwaukee Sentinel*.

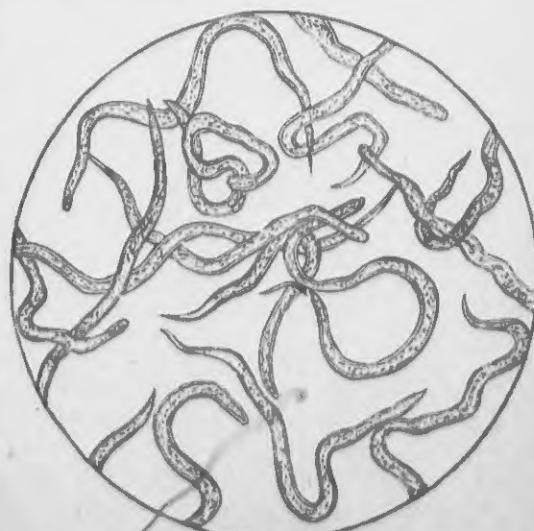


Fig. 10. *Vibrio tritici* found in wheat flour, magnified 100 times.



Fig. 6. Mold (*Penicillium glaucum*) in the highest stage of its development and sporule formation.

EVERYBODY READS THIS.

News of the World.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Arizona.

The people are using their best endeavors to have a United States mint located in the Territory.

The mining troubles have become quite alarming and have almost assumed the character of a revolution. The Legislature has conferred unusual powers on the Governor, and militia will be used to quell the disturbance.

California.

The new overshot wheel at the Murchie mine, built by J. B. Fluck, is 7 feet breast, 125 feet in diameter, and runs with 150 inches of water, a 50-stamp mill. It cost \$2,000, including housing; and as the company has its own water for eight months in the year, it will effect a saving of \$25 per day.

Colorado.

The production of silver from the Leadville mines is great. Large fortunes have been made and new locations are made daily.

A. J. Hager, of Canon City, has ordered of Nordyke & Marmon Co., of Indianapolis, Ind., new process machinery for remodeling his mill.

A favorite Denver brand of flour is called "Four-Ace," and the trade mark on the bags and barrels represents a hand holding four aces. Best flour from Kansas winter wheat retails in Denver for \$2.75 per hundred.

District of Columbia.

The Commissioner of Internal Revenue reports that 1,905,063,300 cigars were consumed in the United States, and 25,312,438 pounds of tobacco otherwise used.

Florida.

Wheat and rye will yield from 20 to 50 bushels to the acre. Oats bear from 20 to 70 bushels to the acre, small grain bringing a high price like that of cotton. Rice is receiving more attention in the State than formerly, and its cultivation might produce handsome results, and yield from 40 to 60 bushels per acre.

Illinois.

The Ottawa Starch Factory is running night and day, and has consumed during the past year 750,000 bushels of corn.

Iowa.

W. R. Derby, of Burlington, is remodeling his mill to the new process.

Jacob Heflefinger, of Pleasant, Plain, will rebuild the Keota mill burned last summer.

Messrs. Schofield & Britton have built a steam flouring mill the past season at Reasnor, Jasper county. They have two run of stone in operation with room for three. Reasnor is a new town on the Newton & Monroe railway.

Indiana.

The Encaustic Tile Co., of Indianapolis, is putting in burrs and machinery furnished by Nordyke & Marmon Co., of Indianapolis.

At Deputy, Feb. 3d, a young man named Graston was caught by machinery in a flour mill, tearing the head from and breaking every bone in his body.

The Atlas Engine Works, of Indianapolis, have just furnished an 18 x 32 Atlas-Corliss engine to Messrs. Harmon, Holmes & Co., of Minneapolis, Minn.

Mathew Lynn, of Belden, who has successfully run a mill built for him by the Nordyke & Marmon Co., of Indianapolis, several years ago, has ordered additional burrs and machinery of the above firm.

The sales of the Atlas Engine Works during the week ending Feb. 8th, embraced fourteen engines of their make of various sizes, most of which were to parties owning flouring mills which are under reconstruction and repair.

New Harmony will soon have the third flouring mill which has been erected in that town by the Nordyke & Marmon Co., of Indianapolis, Ind., Mrs. H. M. Phillips of that place having contracted with the above firm for a three-run steam mill, which will be in operation inside of sixty days.

William Runyon and wife and Granville Orent and four of his family at Queensville, were poisoned eating buckwheat cakes. It seems a farmer named Hall had put arsenic in the barn to kill rats and a portion of it became mixed with the buckwheat which was afterwards sold to the parties named. Runyon is quite ill; the others will probably recover.

Kansas.

L. D. Williams, proprietor of the Valley flour mills on the Solomon River, below Beloit, has put in new process machinery and makes patent flour, which is the first patent flour made in the Solomon valley.

Louisiana.

Exports of flour from New Orleans to Havana for 1878 were 34,432 barrels, against 150 in 1877.

Minnesota.

Elliott & Hunter's mill at Dassell started up. Long Prairie, Todd county, wants a flour mill.

Plenty of water yet at Hokah to run the mills.

A Mr. Furman has purchased a flour mill at Mankato.

R. Rood's arm was badly crushed by the

machinery in the flour mill at Stillwater recently.

Frank & Bentzine are building a 2-run mill at New Ulm.

Filer, Stowell & Co., of Milwaukee, now own the 8-run mill at Peterson.

A. Seebeck has purchased C. Betchner's interest in the Diamond Mills at Red Wing.

The cooper shops at Red Wing have closed. Barrels are being superseded by linen sacks.

The Minneapolis Millers' Association profess themselves satisfied with the magnetic process of removing wire from wheat.

Work has been commenced on the excavation for C. M. Hardenbergh's new flouring mill. The building will be 145 by 115 feet.

There is universal complaint about low water throughout the State. Millers having steam power are consequently unusually happy.

A two-run steam mill is about to be erected by John H. Past, of French Lake, who has ordered the outfit of the Nordyke & Marmon Co., of Indianapolis, Ind.

Hon. W. D. Washburn has retired from the firm of Washburn, Crosby & Co., of the B mill. The style of the firm is not changed, the members being Messrs. C. C. Washburn, John Crosby, W. H. Dunwoody and Charles J. Martin.

Missouri.

J. S. Maitland & Co., millers, of Weston, have made an assignment.

Joplin is a good location for a flouring mill. Millers seeking for a favorable location will do well to visit Joplin.

St. Louis has been full of millers from different sections of the country during the progress of the Cochrane suit.

Gallatin citizens want a flouring mill at that place. They are willing to give a reasonable bonus to some one to build there.

The Downton Purifier Co., of St. Louis, have sold ten sets of rolls to Chas. A. Pillsbury & Co., of Minneapolis, Minn.

The Mexican excursion party returned to St. Louis and Chicago Feb. 16th. They had a grand time and did considerable business, besides having heaps of fun.

A complete new process mill is being erected by Craig & Coster, of Memphis. The entire machinery is being manufactured by Nordyke & Marmon Co., of Indianapolis, Ind.

Michigan.

The Mayflower Mill at East Saginaw has 7 run of stone.

A. C. Cary & Co., millers, Grand Rapids, have dissolved partnership.

Saginaw City has two flour mills. J. F. Brand has 3 run and Johnson's mill 2 run.

Maine.

Colburn, Emery & Co., millers, at Bucksport, have gone out of the business.

Montana.

The white settlers are very much excited over the threatened return of Sitting Bull, with a following of 5,000 warriors. At this time there is but one company of troops between the savages and the white settlements. Mr. Bull, you had better stay in the dominions of your friend John Bull.

Nebraska.

Since the Union Stock Yards were established in Omaha, about five months ago, they have handled 45,000 head of cattle.

The citizens of Omaha and vicinity have shipped a carload of flour to Glasgow, Scotland, for the relief of the unemployed and distressed in that city. Free transportation was furnished to New York by the railroads, and by the Anchor Line steamships thence to Scotland.

New York.

Wm. R. Ham, miller, of Madalin, died recently.

Halleck & Co., millers, of Oriskany, have dissolved partnership. S. P. Halleck continues.

A corn mill is being erected by H. Van Derbeck, of Hoboken, who has purchased burrs and bolts of Nordyke & Marmon Co., of Indianapolis, Ind.

Vanderbilt has purchased the Tift elevator, Buffalo, capacity 300,000 bushels, elevating 800 per hour. Reported price, \$255,000.

The Buffalo Board of Trade has adopted the report of the Committee recommending the buying of and selling of grain, flour, etc., by the central when adopted by the New York Produce Exchange.

Ohio.

Coup Bros., millers, of Navarre, have made an assignment.

Henry Coombs, of Roseville, is building a two-run mill furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

A two-run steam mill has been ordered by Henry Coombs, of Roseville, of the Nordyke & Marmon Co., of Indianapolis, Ind.

Pennsylvania.

Kemble & Coleman, millers, at Tidionte, have failed.

Wm. Mellon & Sons, of Beaver Falls, have ordered of Nordyke & Marmon Co., of Indianapolis, Ind., a large bill of machinery for the purpose of remodeling their mill.

Texas.

The annual cattle crop of Texas is estimated

to be worth \$10,000,000; hides, \$1,800,000; beef in barrels, \$2,000,000, and wool, \$1,500,000.

Tennessee.

Tennessee raised 350,000 bushels of peanuts last year. There's nuts for you.

Utah.

An immense deposit of native paraffine or mineral wax has recently been discovered in Southern Utah, which exceeds anything of the kind in the world. This deposit occupies an area 60 miles long by 20 miles in width, and in some places forms a bed 20 feet thick. It contains more or less clay in seams or layers, but this is easily eliminated by melting, the earthy matter settling, leaving the paraffine nearly pure. It is quite black in the mass, but in sections is translucent. It is said to be readily soluble in ether, and melts at 60 degrees Centigrade. This immense deposit is thought to be an evolved product, the distillation of beds of cretaceous lignite, and the residue of a petroleum unusually rich in paraffine.

Wisconsin.

Steinberg's paper mill, at Weyauwega, burned Feb. 24th. Insurance, \$14,000.

A manufactory of paper bricks has commenced work. They are made from wood pulp.

The wife of Gustav Koepke, a journeyman miller living in Milwaukee, has secured a divorce on the ground of cruelty and inhuman treatment.

The residence of J. M. Stowell, of the firm of Filer, Stowell & Co., in Milwaukee, was seriously damaged by fire on the evening of Feb. 17th. Damage covered by insurance.

The Indian Ford dam case is still actively going on in Rock and Jefferson counties. This case is a fight principally between some Janesville millers and farmers along Rock River whose lands have been overflowed by the raising of the dam at Indian Ford.

Milwaukee Items.

The Eau Claire Lumbering Company is having a large steam engine furnished by the Cream City Iron Works of this city.

A great many millers from all sections of the country have visited Milwaukee during the past month to examine the Milwaukee Milling Company's new mill with its system of Jonathan Mills' small grinding mills.

Alaska.

There are no flour mills in the Territory, and but two saw mills.

Two salmon canneries are in operation in Alaska, each employing 150 persons.

The United States Court will probably put a revenue cutter in Alaskan waters soon.

Rich discoveries of gold have been made. Emigration to Alaska will be heavy in the spring.

Eight hundred ounces of placer gold has been received at the San Francisco mint from Alaska.

Canada.

Cyrus S. Clark's steam saw mill, near St. Broke, Quebec, burned. Loss, \$30,000; insurance, \$10,000.

An order in the council has been passed prohibiting the importation of cattle from the United States for three months from the 1st of February.

Foreign.

Russia has 500,000,000 acres of forests.

An insane man in London has been committed for threatening the life of the Queen.

The only railroad in Mexico is from Vera Cruz to the City of Mexico, a distance of 503 miles.

Wm. Day has been arrested in London for selling paper bags. So says the *Bakers' Record*.

Bread sells now in England for the same price as in 1770, while the price of beef and butter has advanced 300 per cent.

Fifty-three per cent of the population of France are engaged in agriculture. Of this number one-fifth cultivate their own property.

FIRES AND CASUALTIES.

Lange Bros.' flour mill at New Memphis, Ill., burned.

Hampton & Bolings' elevator at Winterest, Iowa, burned. Loss, \$6,500.

The Barbours flour mills at Jersey City burned Feb. 13th. Loss, \$40,000.

Jan. 20th, W. L. Ridders' mill at Genesee, Ill., burned. Loss, \$13,000; insured.

The Southern Tier flour mills at Corning, N. Y., burned Feb. 22d. Loss, \$40,000.

John Brown & Sons' woolen mill at Philadelphia, Pa., burned Jan. 20th. Loss, \$150,000. Fully insured.

A fire destroyed the saw mill, grist mill, cheese factory and distillery of M. E. Ellsworth, near Hudson, O. Loss, \$10,000. No insurance.

Feb. 10th, Charles Hazen's flouring mill at Eau Claire, Wis., containing about 1,000 bushels of grain was destroyed by fire. Loss, \$7,000; no insurance.

St. Paul, Minn., Feb. 8th.—A special to the *Pioneer Press* says the mill of Frank Nicollin, at Jordan, Minn., burned this morning. Loss on mill and elevator, \$70,000; insured for \$40,000. Among the companies are the Underwriters' and Home, New York, \$7,500,

and \$5,000 in the St. Paul Fire Marine; Hartford, Springfield, American, Central, St. Louis and German, \$2,500 each. Thirty thousand bushels of wheat in the elevator. Fully insured.

QUINCY, Ill., Jan. 23d.—Thomas Jasper & Co.'s elevator was burned last night. The loss is placed at \$12,000; uninsured. The fire was of an incendiary origin.

A terrible boiler explosion occurred at Secor, Ill., Jan. 30th, in L. Gasner's grist mill. The mill was instantaneously destroyed and four persons killed.—Wm. Collins, engineer, Henry Brannas, Wm. Wheeler, foreman on the Toledo road, and young Mahlstick. Joseph Horn was probably fatally injured. The Coroner's verdict was negligence.

Messrs. Herman Co.'s flouring mills and starch works in the Town of Milwaukee, five miles north of Milwaukee, were completely destroyed by fire on the night of Feb. 9th. The fire was caused by the heating of a spindle on a pearl barley run of stone setting fire to the adjacent woodwork. All the buildings, four in number, were reduced to ashes, together with a large portion of the stock, but little of the latter being saved. In three hours from the time the fire was discovered—at about 8 o'clock—the mills were a smouldering ruin. The plant comprised a flouring mill of four runs of stone, a pearl barley mill, a starch factory and five drying kilns, a starch works and a farina factory. The starch works were built six years ago and the mill about thirteen years ago. Last year between \$5,000 and \$6,000 were expended in an improvement of the property by the addition of new machinery. At one time the works were devoted entirely to the manufacture of pearl barley, but of late flour and farina were the specialties of the firm. The buildings were of wood and were uninsured. The stock, both raw and manufactured, were valued at several thousand dollars, and upon this there was an insurance of \$1,000, and that in the Northern Insurance Company, of Watertown, N. Y., had been allowed to lapse. Altogether the loss of Hermann & Co. is \$30,000. Though this proved a severe blow to the manufacturers, they talk of rebuilding the works as early as possible, in order that the business they have created by their superior products may not suffer any undue delay. The employees are to be kept in pay and will assist in an early reconstruction. Parties acquainted with milling of the kind predict that the loss on machinery will be but 33 per cent, and that a large portion may again be rendered serviceable.

ANOTHER PATENT GHOST.

ITS NAME IS BARKER.

Another phase has been reached in the contest of the millers against the claimants of patents for the process by which the "patent" flour is made by purifying the hitherto almost valueless "middlings." The millers had scarcely got over the scare caused by the attempt of Cochrane and others to enforce their re-issued patent, when an attempt was made to obtain a re-issue of another patent obtained some years since by one Barker, with claims almost as broad as those of their former adversary. A thorough search was made to find machines that would ante-date Cochrane's, and has brought to light some containing every principle claimed in the new miller's scare-crow. While these are not old enough to meet the Cochrane case, they are said to go three years back of the Barker patent. A gentleman who is here in the interest of the Millers' National Association, states that they will have no difficulty in defeating the claims of the new aspirant for a patent bonanza. Few millers do not now make use of the process, so the importance of the matter to the trade, and indirectly to the public, may be easily imagined.—*Washington Post*, Feb. 8th.

It is asserted by a reliable gentleman, who is here in the interest of the Millers' National Association, that another raid is about to be made on the millers by the owners of a re-issued patent, which was originally granted to one Barker, in 1869, and which was the first middlings purifier patent issued in this country. There is the same authority for the assurance that there is not the least danger from this new "ring," as machines embodying the same elements as the Barker invention were in use for three years before the issue of the Barker patent, and that one of them is still in existence, and will be brought forward in case there should be any attempt to collect royalty under this re-issue.—*National Republican*, Washington.

It is stated by Col. Collins of the firm of Collins & Gathmann, manufacturers of the well-known Garden City Purifier, that the millers have had a narrow escape from another series of vexatious and expensive lawsuits which would have followed close after the decision in the Cochrane case now on trial in this city. He claims that, but for the enterprise and foresight of his firm in obtaining possession of and preserving the old machine referred to above, the millers would have been at the mercy of these new claimants, whose chances of success would have been a hundredfold greater than those of Cochrane et al. If these statements are correct the millers evidently owe a debt of gratitude to the Garden City Purifier folks for saving them from the tribulation and trouble incident to all patent lawsuits.—*St. Louis Republican*.

Subscribe for the United States Miller. \$1-

TRANSMITTING POWER.—The plan of transmitting power from the engine to the shaftings by means of ropes, has found much favor with mill owners and engineers abroad, the system of arrangement commonly adopted being as follows: The fly wheel is made to serve as driving drum also; it is twenty-two feet in diameter, weighs about twenty tons, and is grooved for the reception of twelve hempen ropes, each six inches in girth, six of the ropes being intended to drive one line of shafting, and six the other. The rope drums or pulleys on the shafting are five feet in diameter, the rims being made heavy and grooved, as is the driving drum, but of course for only six ropes. The width of the grooves is 2 7-16 inches; total depth, 3 1/2 inches; radius of the bottom curve, one-half inch, and the inclination of the two sides to each other about forty-nine degrees. Thus, the ropes do not, even when pressed somewhat out of shape while doing full duty, rest upon the bottom of the grooves, but on the sides, and the wear is, therefore at the points of contact. The wear is found to be tolerably uniform all around the section—thus indicating that the ropes do not, as might be apprehended, present the same parts of their circumference to be continuously gripped to the grooves.

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We hope the milling friends of the UNITED STATES MILLER will be as liberal to it as it has been in the past, and will be toward them in the future. Subscription price, one year \$1. or two years and a half \$2. We shall be pleased to have an early response to this. Fill out the blank below, enclose with money in an envelope, seal carefully and send at our risk. A receipt will be sent by return mail.

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The Millers' Text Book.

By Jan. McLean, of Glasgow, Scotland.

A DESCRIPTIVE AND EXPLANATORY ACCOUNT of the various grains, machinery, and processes used in grain mills. The first clear and successful explanation of said processes ever printed. It treats on and explains all the newest and most improved modes of manufacturing wheat, oats, barley and peas, introducing the three latter mainly with the views of illustrating the principles at work in the proper manufacture of the first. Such as the various modes of storing, cleaning and grinding wheat, and the effects on their proper working with the Baker, showing conditions which must be observed to make flour equal to Hungarian. The effects of the different styles of working mill-stones, rollers and disintegrators contrasted. Also the different modes of separation including gold sifting, the revolving crank roller, the shaker, the wire cylinder, the silk reel, the best mode of working the silk reel. Vertical and horizontal air currents, the effects of air currents well defined principles which govern proper grinding and dressing, where too often all is doubt and uncertainty. And although extensively circulated in Britain the last 12 months, none has yet ventured in print, to controvert its solution of the most difficult problems in the milling business. And being the production of a miller who has been over much of the United States, it can be easily understood by American millers. Price sixty cents, sent post paid. Address all orders to E. Harrison Cawker, Editor of THE UNITED STATES MILLER, No. 62 Grand Opera House, Milwaukee, Wis., who is sole agent for America.

Situations Wanted, etc.

Millers, Engineers, Mechanics, etc., wanting situations, or mill-owners or manufacturers wanting employees, can have their cards inserted under this head for 50 cents per insertion, cash with order.

WANTED—A miller with \$1,500 capital to take an interest in New Process water mill. Write at once for particulars to S. & C., care United States Miller, Milwaukee, Wis. doc

WANTED—A situation as engineer in a large or small mill. Have had 22 years' experience running high-pressure engines of different kinds, and 6 years operating Corlies engines. Can give best of references as to ability and character. Can go any time. Address
J. F. STRAIT, Box 1109, Kalamazoo, Mich. dec3t

WANTED—A situation by a thoroughly practical miller (German). First-class St. Louis reference. Satisfactory reasons given for leaving present situation, where I have been working for the last six years. Address
ADOLPH BRENNER,
1913 Jackson St., St. Louis, Mo. Jan*

SITUATION WANTED—I have had two years practical experience in a good flour mill, and want a situation where I can finish learning the trade. I can furnish first-class reference. Address
GEO. P. WANDER, 512 Spring St., Buffalo, N. Y. mr3t

WANTED—A situation by a miller of long experience in milling in both Germany and America. Has filled responsible positions in several well-known mills in this country. Will guarantee satisfaction. Is married, of steady habits, and can furnish reference as to ability and character. Address at once
J. M. B., care United States Miller, Milwaukee, Wis. feb1t

The large flouring mill of Sparks & Best burned at Springfield, Ill. It was the largest mill in that section, and the loss is estimated at \$50,000; \$29,000 of this amount is covered by insurance.

For Sale or Exchange.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—Cheap—A two-run merchant mill in a good wheat country, on the Illinois Central R. R. For particulars, address
W. GILBREATH,
Elkville, Jackson Co., Ill. feb*

FOR SALE—A two-run water power merchant flouring mill. For information and particulars, call on or address
J. H. HARTWELL, Deputy,
Jefferson county, Ind. Jan*

FOR SALE—Three-run water mill and 63 acres of land; good house and barn; plenty of custom. Cheap for cash, or half cash.
JNO. F. MCGUIRE,
Clinton, Iowa. mrlt

FOR SALE—Two-run steam mill; best run of custom in the county; two houses and barn. Pays 10 per cent on \$8,000. Cheap for cash, or half cash.
JNO. F. MCGUIRE,
Clinton, Iowa. mrlt

WANTED—To buy or rent a mill, by a practical miller thoroughly versed in merchant and grist work. Talks both English and German, and can give best of references. Address,
S. KAMERER,
Fountain City, Buffalo Co., Wis. mrlt

WANTED—A good steam flouring mill at Cawker City, Kansas. The location is exceptionally good. The best of wheat and other grains produced in great abundance. The investment will surely make heavy returns. The Atchison, Cawker City & Denver Railroad will be completed to this point on or before June 1st, 1879. Parties desiring to secure a good location may address for any further information,
EDMUND O. GARRETT,
Cawker City, Mitchell Co., Kan. feb1t

FOR SALE—A superior mill site in southern part of Illinois, suitable for a custom and merchant mill. The location is in one of the best wheat-growing sections of the State, and enjoys railroad facilities to all points East and South. At one end are two 4-flued boilers in perfect condition. All will be sold at a bargain. For full particulars, please address,
T. MBS, MEYER & CO., 120 & 122 S. Main St.,
St. Louis, Mo. feb*

FOR SALE—A flour mill on Pawpaw Creek, in Mecklenburg Co., N. C. Mill is a three-story building, first-story rock, second and third wood. Rock dam. Two run of stone, one for wheat and one for corn, with other machinery, run by 17-foot overshot water-wheel. Also saw mill with improved circular saws, etc.; 194 acres of land go with the property. Price, \$4,100. This is a fine opportunity for an enterprising miller to make a fortune. Address
DAWSON & CO.,
Charlotte, N. C. Jan*

FOR SALE OR RENT—One of the best steam flouring mills in the State. Four stories, brick and stone, slate roof, four run of burrs. Adapted to new process. Everything new. Best wheat region of the State. Fuel cheap, water plentiful. Near depot and has side track, cooper shop, wagon and stock yards. Pleasant town of 2,000 inhabitants. Satisfactory reason given—neither of us know anything whatever about milling. Terms easy. Fine bargain. Address
C. H. HEARD & SON,
McLeansboro, Ill. feb*

FOR SALE—A 3-story frame water-power mill, with two-run of burrs. The machinery is in good order, improved purifier, mill arranged for both merchant and custom mill. The mill property includes barn, sheds and cottage, young orchard, 300 Acres of Land, 100 acres under cultivation, and the rest in hay and wild land. The undivided half of the above will be sold for \$4,000, part down, and the balance on time. Address
I. W. DICKINSON,
Sabula, Jackson county, Iowa. Jan*

FOUR MILL WANTED—In Exchange—I have the exclusive right of 20 Counties in the State of Michigan to manufacture and sell Elliott's Improved CENTENNIAL HARROW, with \$1,000 worth of Harrows on hand ready for the Spring Market, which I wish to trade for a good Custom Mill. Would be willing to take property with some encumbrances. The Harrow mentioned is the best one yet manufactured, sells readily as every farmer wants one, and yields a net profit of 200 per cent on cost of manufacture. Being a practical miller I prefer to confine myself to that business. Address
J. M. SHACKLETON,
Plainwell, Allegan Co., Mich. Jan2t

FOR SALE—A good custom and merchant mill, three stories high, built of stone, with three run of burrs; good water power, close to railroad. Also two dwelling houses and all necessary outer buildings, all covered with slate. The mill has all been rebuilt, with middlings purifier and all necessary machinery. The mill is now running day and night. Good grain country. This property is a splendid home and business, and will be sold very cheap. For particulars call on or address
E. G. GILBERT,
Raubsville, Northampton Co., Pa. feb*

FOR SALE—A 2-run flour mill. Good burrs and bolts in perfect order and doing a good business. Water-power has 14 feet fall, fed by lake. No ice or floods to contend with. The mill makes good flour and there is plenty of grain in the vicinity. The mill lot contains 4 1/2 acres in the town with two dwelling houses, large barn and shed. With the mill will be sold 30 acres of timber land one mile from town. Terms: \$2,000 cash down, and balance in store goods or on five years time. Address for full particulars,
WM. SKINVER,
Mount Morris, Waushara Co., Wis. feb1t

FOR SALE—Best Mill in Southern Pennsylvania—This mill, situated in a small village within 1/2 mile of Broad Top coal fields, was recently rebuilt with all modern improvements and is in good repair. Mill is on a never-failing stream, with 30 feet head and is propelled by two turbine wheels. Has three run of burrs and one run of choppers. Building is frame, 42 by 60, and four stories high. Machinery is suited for making either merchant or custom work. Belonging to the mill are a good saw mill, 180 acres of farm land, 100 acres of valuable bark-timber land, three dwellings and a store-room. The owner of the above property will also sell three separate tracts of good bark and fine timber land, containing 400, 280 and 72 acres. For further particulars call on or address,
WILSON BERGSTRESSER,
New Grenada, Fulton Co., Pa. feb*

FOR SALE OR RENT—A five-run steam mill, located at Manchester, St. Louis Co., Mo., eighteen miles west of the city of St. Louis. It is located in a never-failing wheat country and is supplied directly by the farmers at reasonable figures. The mill has been run profitably for the past sixteen years. Was rebuilt on a thorough and convenient plan six years ago. Good reasons for wishing to sell or rent. Mill is running to its full capacity and is doing a good business. No competition, no railroads. All of the offal sold at the mill, and a large trade established for the flour. Will be sold to parties having part cash; long time given for remainder at a reasonable rate of interest, or will rent on reasonable terms. Address or call on the proprietor,
JACOB SCHREINER,
Manchester, Mo. feb*

FOR SALE—A four-run steam flouring mill, all in first-class running order. Three 3 1/2 foot burrs for wheat and one 3 1/2 foot chopping burr, one Eureka wheat cleaner and a Eureka smutter, Garden City middlings purifier, Excelsior bran duster, Eureka flour packer and all other machinery necessary to complete a first-class mill. Two 28-horse boiler, 65-horse power engine. Still-well heater. Frame building and seven desirable town lots belonging to the property. Side track of A., T. & S. Railroad close by the mill, which is located in the city of Sterling, Rice Co., Kansas, in the midst of the best wheat district in the Arkansas valley. The parties owning the mill are not practical millers, and are engaged in other business. They will sell the property low and on easy terms. Address
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Sterling, Rice Co., Kan. feb*

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Elizabethtown, Hardin county, Ill. Jan*

FOR SALE—Two-run Steam Grist Mill, at North Union, Montgomery county, Ind., on L. C. & G. W. R. R. Will sell cheap for cash, or on time and. Call on or address
J. H. ARMANTROUT & CO.,
North Union, Ind. Jan*

FOR SALE—A whole or a half interest in a good three-run steam mill in a good wheat country. Mill doing a good business. Half will be sold very cheap. Address
ROGERS & RAMBACH,
West Liberty, Iowa. feb*

FOR SALE—A mill site for a first-class water-power, 80 rods from the lake shore, on Pike River, three miles from Bayfield, Wis. The water-power will do the work of a 50-horse power engine. Address for further information
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FOR SALE—A good saw and grist mill, driven by 20-foot overshot wheel and abundant water-power, with 100 acres of choice land & of a mile from Brevard, Transylvania county, N. C. Price, \$5,600. Address
DAWSON & CO., Charlotte, N. C. Jan*

FOR SALE—Steam power saw mill for sale cheap, and on reasonable terms. Mill is in good location, and is doing a good business. Satisfactory reasons will be given for selling. Call on, or address
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FOR SALE—A Steam Grist Mill, with two run of stone, a Steam Saw Mill, two Houses, Barn, Shop, and 3 acres of Land, on Lake Shore Railroad, 15 miles from Buffalo, N. Y. Will be sold at a low price to close an estate. Address
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WANTED—To Exchange—Good fresh stock of general merchandise, best location in growing country seat, for a first-class custom flouring mill in a good location for permanent business. Kansas preferred. Give full description and cash valuation. Address
W. H. WALLACE, Newton, Jasper Co., Ill. Jan*

FOR SALE—Mill Property for Sale or Exchange. A three-run Grist Mill and Saw Mill, all driven by water. Price, \$6,000. Would take part of the purchase price in Iowa, Nebraska or Kansas lands. Address
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Worcester, Otsego Co., N. Y. Jan*

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FOR SALE—Circular Saw and Grist Mill; bench saw; run of four foot stone; large pond; 20 feet head; good house and barn, and four acres of land. Located in West Northfield, Mass., three miles from South Vernon. Would take a good portable engine, 25-horse power, for part pay. Address
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FOR SALE—A Wind-power Grist Mill with 60 foot wheel, three run of stone, cleaning and bolting machinery comp etc. Located in one of the best wheat-growing sections of Minnesota. Railroad will be built to the place next summer. Will be sold cheap and on easy terms. Address
JOHN MANUEL,
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Maiden Rock, Pierce Co., Wis. Jan*

FOR SALE—One of the best mill properties in Michigan, consisting of flouring mill with three run of large millstone, saw mill, cooper shop, warehouse, store (with or without goods), light dwelling houses all in good repair, with barns and about 27 acres of land, 100 miles west from Detroit, on the Michigan Central R. R. Address
JOHN EVANS,
Marquette, Mich. Jan*

FOR SALE—A flouring mill, saw mill and 265 acres of land; 55 acres improved at a price to suit the times for one-half cash; balance long time. The water power is unsurpassed; two run of burrs with necessary machinery. Mill thoroughly repaired last season. Good wheat country. Situated at Orange, Juneau Co., Wis., on the M. & St. P. R. R. Address
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A. J. FULLERTON,
Bonduel, Shawano Co., Wis. feb2t

FOR SALE—We offer for sale the steam merchant flouring mill located at Peterson, Fillmore county, Minn., one of the finest wheat growing counties in the State. The mill is situated on the Southern Minnesota railroad, with side track to the door of the mill, thus giving the best of facilities for grinding wheat in transit. This road is being rapidly extended westward into the best wheat growing section in the Northwest, so that the facilities for obtaining choice milling wheat are growing better each year. This mill was built in 1876; is 40 x 60 feet; three and one-half stories high above the basement. Contains eight run of burrs, with all the modern machinery; brick boiler and engine rooms, practically fire-proof, adjoining the mill 30 x 40 feet; two boilers and 22 x 26 inch cut-off engine built by us. The mill has a capacity of 160 barrels per day, and has a well established trade, the flour commanding the highest price in the market. This property will be sold cheap as we have no use for it. For further particulars inquire of
PILGER, STOWELL & CO.,
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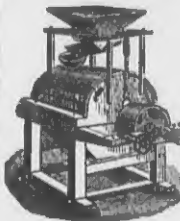


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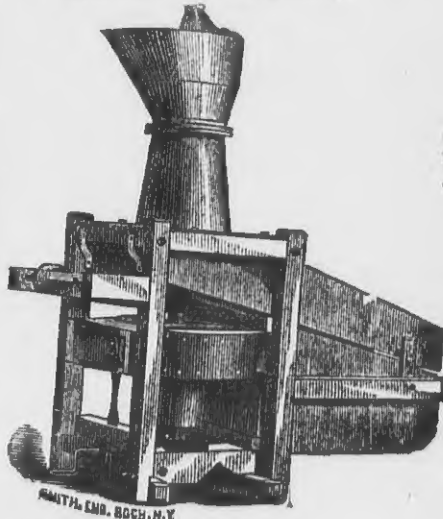
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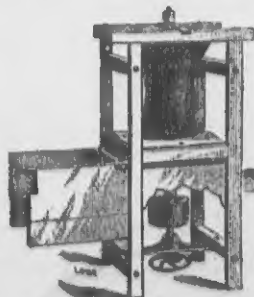
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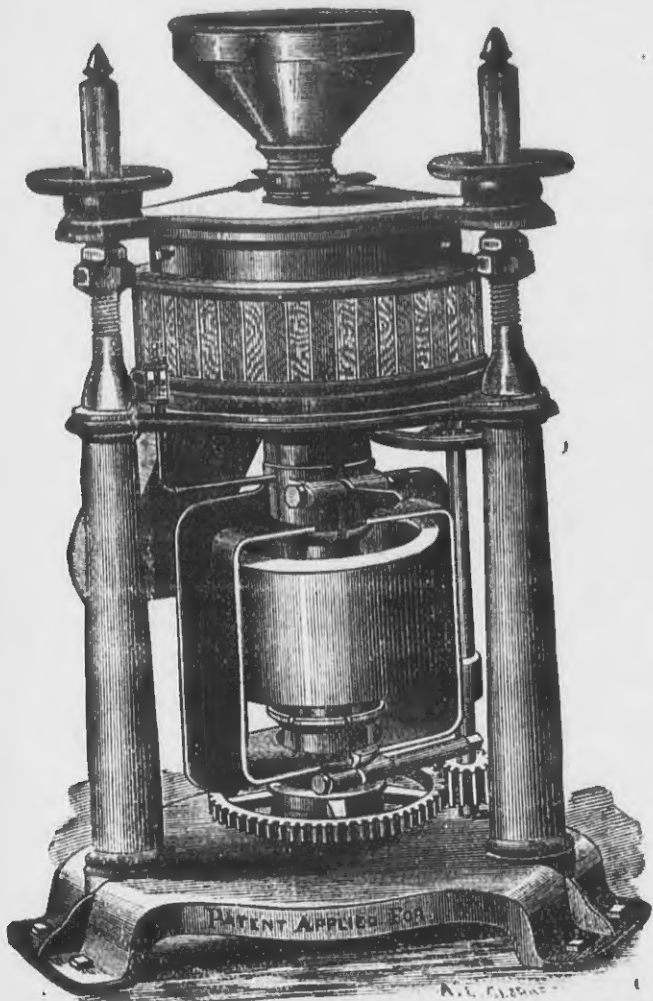
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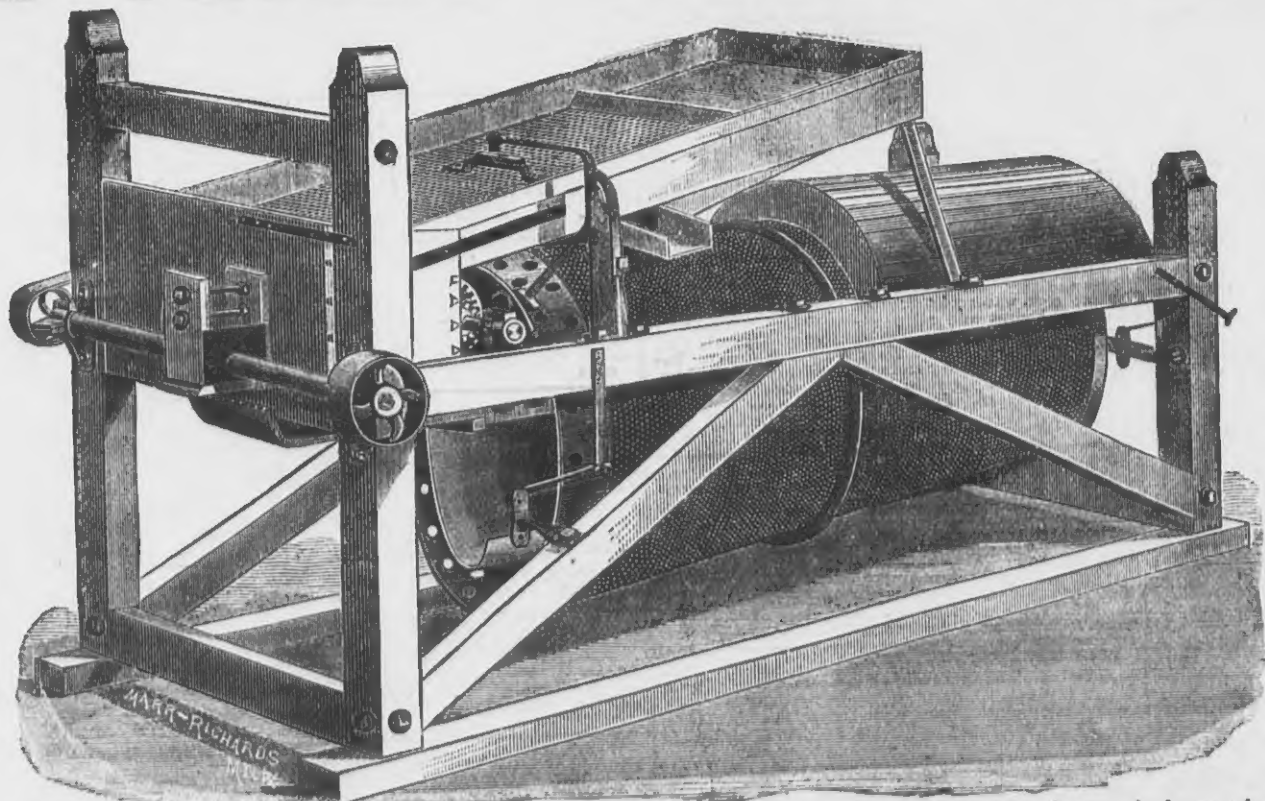
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MINNEAPOLIS, Minn., Jan. 9, 1879.—Cockle Separator Manufacturing Company—Gents: We have used your Cockle Separator for the past three years, to our entire satisfaction. We commend them to all in want of a perfect machine. Yours truly,
J. A. CHRISTIAN & CO.

MINNEAPOLIS, Minn., Jan. 16, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gents: In answer to your favor, would say that we have in use four of your Cockle Machines, and find them to be the only machines that we have yet seen that will separate the cockle from the wheat. The improved machines give us no trouble in any way. We shall want two more machines soon, to replace those burned in our Anchor Mill. Yours,
CHAS. A. PILLSBURY & CO.

MINNEAPOLIS, Minn., Jan. 9, 1879.—Cockle Separator Manufacturing Co., Milwaukee: We are using two of Kurth's Patent Cockle Separators, and while they work somewhat to a disadvantage on the present crop, we know of nothing that will do the work as well. We consider them the best machine made. Yours truly,
BULL & NEWTON.

AKRON O., Jan. 27, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gentlemen: Having three of your

Send for Illustrated Catalogues, describing machine fully with diameter, capacity, etc., to

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FERD. SCHUMACHER.

OSWEGO, N. Y., Jan. 29, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gents: We are pleased to say that our use of your machines for the last two years, has been highly satisfactory, and especially do we like the new double suction machine, which does its work so perfectly that we would not like to do without it. Indeed we deem the machines indispensable in good milling, particularly with spring wheat. Your friends,
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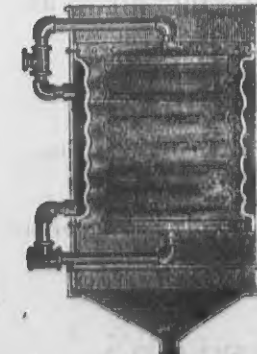
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3 x 3 1/2	8c
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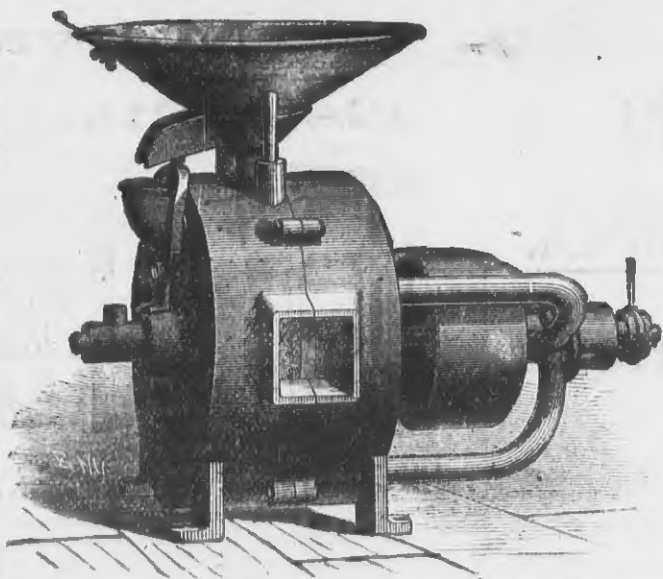
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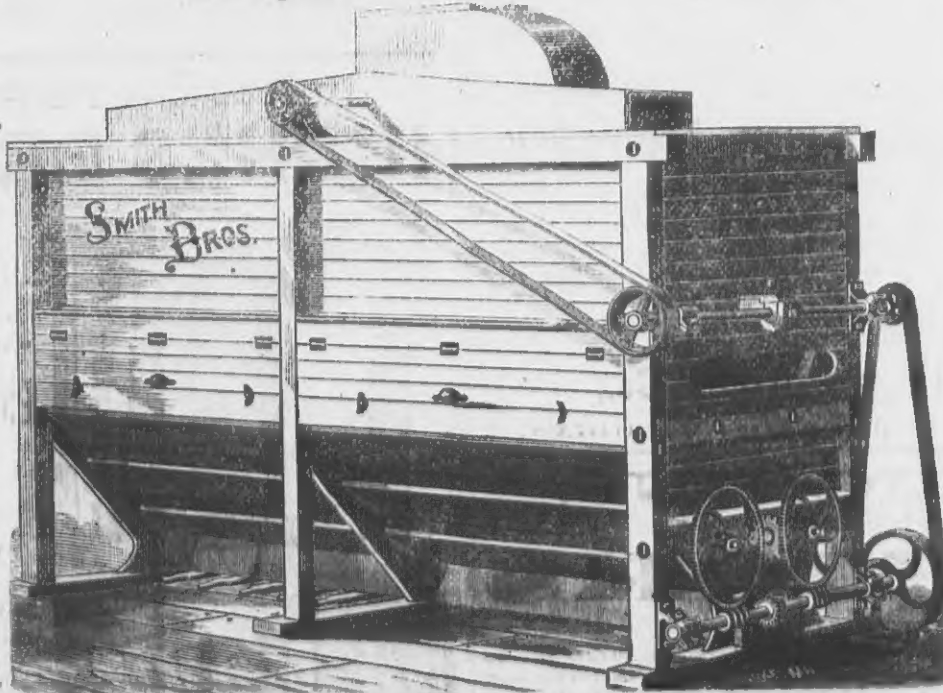
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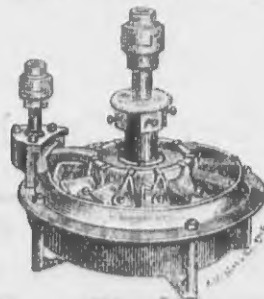
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